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REPORT ON
TERMINAL FACILITIES
OF THE CITY OF BOSTON
1916

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The Commonwealth of Massachusetts.

REPORT

OF THE

TERMINAL COMMISSION

ON

TERMINAL FACILITIES.

PURSUANT TO CHAPTER 144 OF THE RESOLVES OF 1915 AND CHAPTER 382 OF THE SPECIAL ACTS OF 1915.

APRIL 1, 1916.

BOSTON:
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THE TERMINAL COMMISSION.

From the Senate.

JAMES F. CAVANAGH,
Chairman.

MARTIN HAYS.

From the House.

HERBERT A. WILSON.

FRED P. GREENWOOD.

ROBERT ROBINSON.

From the Governor.

CHARLES M. SPOFFORD.

LUKE D. MULLEN.

From the Mayor of Boston.

FREDERICK H. PRINCE.

WILLIAM H. COOLIDGE.

EDWARD J. DUNN,
Secretary.

JOHN B. BABCOCK, 3D,
Engineer Assistant.

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LEGISLATION.

CHAPTER 144, RESOLVES OF 1915.

RESOLVE PROVIDING FOR THE APPOINTMENT OF A COMMISSION TO INVESTIGATE THE SUBJECT OF TERMINAL FACILITIES AND THE IMPROVEMENT OF FACILITIES FOR THE TRANSPORTATION OF FREIGHT IN THE METROPOLITAN DISTRICT.

Resolved, That a commission be appointed, to be called The Terminal Commission, which shall investigate the subject of terminal facilities and shall also consider the improvement of facilities for the transportation of freight in the metropolitan district. The commission shall investigate the best method and the means for the development and improvement of the facilities for the transportation of property to, in and from, and with relation to the city of Boston; the need and possibility of providing necessary interurban facilities for the transportation of freight, including the practicability and probable cost of constructing freight lines for the accommodation of steamships, railroads, warehouses, markets and manufacturing and industrial establishments; the desirability, feasibility and probable cost of promoting business opportunities within the metropolitan district by the establishment of industrial centres, together with the nature of the service and the routes therefor best adapted to meet the transportation requirements of such industrial centres; and the proportion of the cost for the development and improvement of such transportation and for the establishment of such industrial centres which should be borne by the commonwealth, by the city of Boston and by public service corporations, respectively. The commission shall serve without compensation; shall have a room in the state house assigned for its use; shall give such public hearings as it deems necessary; may employ such assistants, clerical or otherwise, as it may require; and shall receive such sums for expenses, travelling and otherwise, necessarily incurred, as shall be allowed by the governor and council; one half of all such sums to be paid by the commonwealth and one half by the city of Boston. The commission shall be constituted as follows: — Two members of the present senate, to be appointed by the president of the senate; three members of the present house of representatives, to be appointed by the speaker of the house; two persons, experts on the subject of transportation, to be appointed by the governor; and two persons, experts on the subject of transportation, to be appointed by the mayor of the city of Boston. The commission shall report to the next general court on or before the first day of April. [*Approved May 28, 1915.*

CHAPTER 382, SPECIAL ACTS OF 1915.

AN ACT MAKING AN APPROPRIATION FOR EXPENSES OF THE SPECIAL COMMISSION TO INVESTIGATE THE SUBJECT OF TERMINAL FACILITIES AND THE IMPROVEMENT OF FACILITIES FOR TRANSPORTATION OF FREIGHT IN THE METROPOLITAN DISTRICT.

Be it enacted, etc., as follows:

SECTION 1. The sum of ten thousand dollars is hereby appropriated, to be paid out of the treasury of the commonwealth from the ordinary revenue, for the expenses of the commission to investigate the subject of terminal facilities and the improvement of facilities for transportation of freight in the metropolitan district: *provided, however*, that one half of the expenses paid from this appropriation shall be repaid by the city of Boston, and the treasurer and receiver general is hereby authorized and directed to assess the same upon that city, as a part of the state tax, as soon after the work of said commission has been completed as conditions will permit.

SECTION 2. This act shall take effect upon its passage. [*Approved June 4, 1915.*

The Commonwealth of Massachusetts.

REPORT OF THE TERMINAL COMMISSION.

To the Honorable Senate and House of Representatives of the Commonwealth of Massachusetts.

The Terminal Commission, appointed under chapter 144 of the Resolves of the year 1915 and chapter 382 of the Special Acts of the year 1915, has the honor to submit herewith its report.

The Legislature's purpose in providing for the appointment of the Commission is outlined as follows: —

> The commission shall investigate the best method and means for the development and improvement of the facilities for the transportation of property to, in and from, and with relation to the city of Boston; the need and possibility of providing necessary interurban facilities for the transportation of freight, including the practicability and probable cost of constructing freight lines for the accommodation of steamships, railroads, warehouses, markets, and manufacturing and industrial establishments; the desirability, feasibility and probable cost of promoting business opportunities within the metropolitan district by the establishment of industrial centres, together with the nature of the service and the routes therefor best adapted to meet the transportation requirements of such industrial centres; and the proportion of the cost for the development and improvement of such transportation and for the establishment of such industrial centres which should be borne by the commonwealth, by the city of Boston and by public service corporations, respectively.

In pursuance of the act, on June 4, 1915, the President of the Senate named as members of the Commission from the Senate, Hon. James F. Cavanagh of Everett and Hon. Martin Hays of Boston; and the Speaker of the House of Representatives on the same day named as members of the Commission from the House, Representatives Herbert A. Wilson of Boston, Fred P.

Greenwood of Everett, and Robert Robinson of Boston. On June 28 His Honor the Mayor of Boston appointed Messrs. Frederick H. Prince and William H. Coolidge of Boston members of the Commission; and on June 29 His Excellency the Governor of Massachusetts appointed Messrs. Charles M. Spofford and Luke D. Mullen of Boston members of the Commission.

The Commission organized on July 1, 1915. Senator James F. Cavanagh of Everett was elected Chairman. Edward J. Dunn of Boston was elected Secretary.

Immediately after organizing, the Commission established office hours in which to meet all persons interested in the improvement of the terminal facilities of the Metropolitan District. For the first few days these hours were from 11 A.M. until 2 P.M. each day. After that, and up to the date of the submitting of this report, the Commission's office has been open during the regular business hours at the State House, and there has always been somebody present to meet the public for the purpose of receiving information or answering questions.

An idea of the work of the Commission may be obtained from the volume of its correspondence. During the nine months of the Commission's existence, more than 13,000 letters were sent out from its office.

Recognizing that the time which it was given to complete its investigations was comparatively short, considering the task before it, the Commission started to work immediately after its organization.

In order to get the views of as many representative citizens of the Commonwealth as possible on the various aspects of the problem which confronted it, the Commission decided to hold a number of public hearings. During a period which covered about four months, fifteen such hearings were held.

It was determined by the Commission to invite the general public to discuss the question of the improvement of the terminal facilities at the first hearing and to continue such hearings for the public until those who did not represent municipalities, organizations or transportation companies had all been heard.

The Commission later gave special public hearings for the

officials of the various cities and towns and of the business and other organizations of the Commonwealth, and of the various transportation companies in the Metropolitan District.

In order that there should be no confusion and that all who desired to address the Commission might be given ample time in which to be heard, these later hearings were assigned to groups as follows: —

(1) Officials of the city of Boston and representatives of the business, improvement and other organizations within that city.

(2) Officials of the cities and towns in the Metropolitan District and representatives of business, improvement and other organizations in that district.

(3) Officials of the cities and towns in Massachusetts outside of the Metropolitan District, and representatives of the business, improvement and other organizations in that section of the State.

(4) Representatives of the State Branch of the American Federation of Labor; of the Boston Central Labor Union; and of several other labor organizations, the members of which it was thought might be particularly interested in the terminal facilities problem.

(5) Officials of the railroad, street railway and steamship companies of the Metropolitan District.

Notices of these hearings were given in advance through advertisements in all of the Boston newspapers, by letter, and in the news columns of many of the daily newspapers of the State.

The officials of the various cities and towns of the State and of its business and improvement organizations were urged by the Commission to institute local investigations of the transportation conditions of their respective municipalities with a view to making such suggestions for the improvement of the terminal facilities of the Metropolitan District as might tend to better the conditions in Boston and other cities and towns of the Commonwealth. In nearly every case, the officials in question were given several weeks in which to prepare themselves to set forth properly their views to the Commission.

The various railroads were represented at each of the Com-

mission's hearings, and representatives of all three of the principal railroads entering Boston addressed the Commission on the day assigned for the public hearing of the officials of the transportation group. No representative of a steamship or street railway company addressed the Commission, although representatives of some of these companies attended all the hearings, and others wrote to the Commission, stating that the officials of these companies did not have any suggestions to offer.

In addition to holding these hearings, the Commission invited the representatives of all of the cities and towns, organizations, and transportation companies mentioned above, to send written communications to the Commission, giving their views on the subject-matter of the Commission's investigation.

The Commission inspected the various railroad terminals of the city, as a Commission, while individual members inspected the steamship terminals from time to time and made further studies of the city's railroad terminals.

In an effort to secure from the manufacturers of the State information as to the real conditions respecting the transportation of freight in this Commonwealth, the Commission sent to every known manufacturer in the Commonwealth a list of questions bearing upon this subject. The total number of manufacturers asked for information was about 8,500. Replies were received from 1,257. In view of the fact that but one communication was sent to those manufacturers; that the question blank of the Commission was necessarily long; that the manufacturers are being continually asked by Federal and State officials for information respecting their business, and that for various reasons the manufacturers are as a whole reticent about disclosing information respecting their businesses, the percentage of replies received was exceedingly gratifying to the Commission. Replies were received from manufacturers in every city in the State and in 125 towns. Of the 275 different industries in the State 177 were represented in the replies.[1]

[1] Appendix D contains a summary of the information obtained from the manufacturers' answers.

Visits were made by representatives of the Commission to plants of individual manufacturers, to the various railroad freight houses and freight yards, to steamship terminals and to the officers of forwarding companies. Studies were made by representatives of the Commission of the switching, lighterage and car-float rates at Boston.

Abstracts of the reports of the more important previous commissions were prepared for each member of the Commission, and a careful study of these was made.

Early in the Commission's investigations it became evident that there was comparatively little reliable and up-to-date information available respecting the terminal facilities of other large cities of the United States and Canada. It was felt by the members of the Commission that although a certain amount of information respecting the conditions in other cities might be obtained through correspondence, only by personal visits could a speedy and comprehensive understanding be had of what these cities have done, are doing, and plan to do. Accordingly the Commission, with the consent of the Governor and Council, inspected the terminal facilities of New York, Chicago, Philadelphia, St. Louis, Baltimore, Kansas City, New Orleans and Houston in this country and of Montreal in Canada.

All of the cities visited, with the exception of Houston, Tex., were included in the Commission's original inspection program because of their importance as cities, or because of their particular methods of dealing with the terminal problem. The terminal facilities of Houston were inspected by the Commission during a few hours which its members were required to spend there because of poor train connections, due to a storm. The enterprise and ambition of the officials of this busy city in connection with terminal development had also been brought to the attention of the members of the Commission by officials of other cities.[1]

In addition to visiting personally the more important cities which could be inspected in the time that the members of the Commission felt could be given to this phase of the work, the Commission wrote to the officials of every city of 100,000

[1] Appendix B gives a brief report of the Commission's trips.

population or over in the United States and Canada, asking for information respecting the terminal facilities of their respective municipalities. The condition in several smaller cities also interested the Commission and the officials of these cities were requested to supply data. Officials of the Chambers of Commerce, Boards of Trade, and like organizations of all the above cities, and in some instances railroad officials were also requested to furnish the Commission with certain information. In this way the Commission secured data relative to the terminal facilities of 43 cities of this country and Canada, which, with the cities visited by the Commission, make a total of 52 cities from which this Commission has received information.[1]

The Commission felt that on account of the great war which is now in progress it would be useless to seek information respecting the terminal facilities of European cities from the officials of such municipalities. As a result, the Commission had recourse only to data, respecting these latter municipalities, contained in previous reports and in the various standard works on file in the State and Boston Public Libraries and in the library of the Massachusetts Institute of Technology.

History of Previous Reports.

The Commission found that the history of the public investigation of the terminal facilities of Boston has been a long and varied one.

Investigation after investigation has been made. Special commission after special commission and special committee after special committee has been appointed in rapid succession to probe into this subject.

Since 1826 when the first committee was appointed to investigate the advisability of building a railroad from Boston to the Hudson River, there have been no less than 41 reports by special commissions and committees on the subject of the transportation facilities of Metropolitan Boston.

During the last twenty-five years there have been 22 of the more important of these reports. Thus during a quarter of a

[1] For data respecting terminal facilities of principal cities of the United States and Canada, see Appendix C.

century now being rounded out there has been a special commission or committee appointed to consider this subject, or some phase of it, for almost every year in that period.

The following is a list of the reports of the more important of these special commissions and special committees during the last twenty-five years, and also a summary of the more important recommendations contained in these reports.

1891–92. — Commission to promote rapid transit for Boston and suburbs recommended complete readjustment of terminal facilities of the steam roads entering Boston, including the construction of the North and South Stations and two lines of elevated road; the separation of freight business from passenger traffic; the readjustment of certain street lines; the reorganization of the street railways; and the revocation of the charter of the Grand Junction road.

1893. — Surveying Department of the city of Boston made an investigation and recommended that the Union Freight Company be required to do its business at night; urged a general city plan; made suggestions for street widenings and for the development of the South Bay district; the relocation of the Boston & Maine and Boston & Albany freight railways in East Boston, and of the water-front line there; also the construction of an elevated railroad and proper ordinances for use of streets.

1893. — Joint Special Legislative Committee investigated the question of rapid transit in Boston and recommended the creation of a Metropolitan Transit Commission; the construction of an elevated railroad; and the construction of the Tremont street subway. (Metropolitan Transit Commission Act passed by the Legislature but rejected by the people on referendum.)

1894. — Surveying Department of the city of Boston made an investigation and urged the development of water-front facilities and the adoption of a scientific plan for improvement of water transportation conditions of the district.

1894. — Joint Special Committee of Boston City Council reported in favor of establishing a modern dock system, under public control, and the construction of an elevated railroad system, to start in Lovejoy.

1897. — Massachusetts State Board on Docks and Terminal Facilities made an investigation of public needs in water-front terminal facilities and urged public ownership and use of water front and wharves, but the Board of Public Works, by a vote of three to two, declined to undertake public ownership of water-front terminal facilities.

1897. — Transit Commission of Boston urged the construction of a subway to improve the rapid transit facilities of Boston and a location of a permanent transit union station or stations for the concentration and union of local and suburban railroads, etc.

1907-08. — Boston Transit Commission investigated teaming traffic, freight movements, and the proposed tunnels for freight transportation including teaming tunnel in Boston. The Commission declined to recommend construction of teaming tunnels or widening of streets at that time.

1907-08. — Commission on Commerce and Industry reported in favor of merger of Boston & Maine and New York, New Haven & Hartford railroads.

1907-09. — The Metropolitan Improvements Commission recommended sweeping changes in the terminal facilities of Metropolitan Boston and the appointment of a commission to work out plans for the same. It was stated by the Commission that the most feasible method for bringing Boston's ill-conceived, inadequate terminals into one great terminal system would appear to be through a terminal company to be organized and promoted by the joint action of the public and all the railroad authorities.

1909-11. — Joint Commission on Metropolitan Improvements took up uncompleted work of Metropolitan Improvements Commission, favored electrification of steam railroads without compulsion, and made many other recommendations.

1910. — Joint Board of Railroad and Transit Commissions investigated subject of Dorchester tunnel, and recommended that Cambridge subway be extended to Andrew Square.

1910. — Joint Commission on Subways and Tunnels favored extension of Cambridge subway to South Station, the improvement of East Boston tunnel, but did not favor the extension of the elevated railway from Sullivan Square to Medford.

1910. — Joint Board on the New Haven railroad reported road should not forfeit charter, but should petition Legislature for the validation of violations of law; recommended that a commission be appointed to make a valuation and see if assets covered liabilities.

1910-11. — Commission on Extension of Subway and Tunnel Leases made several recommendations respecting the financial aspect of operating these facilities.

1911. — Joint Commission recommended improvements in transit facilities of Chelsea, Revere and Winthrop.

1911. — Joint Commission, comprised of same persons who were members of Board which reported on New Haven road in 1910, investigated the question as to whether or not assets of the New Haven road were as great as the liabilities, and also to recommend what legislation in the future was advisable in regard to issues of stock and bonds, etc. Commission reported that the assets were as great as the liabilities and recommended that no special legislation for the New Haven be enacted, but that certain acts dealing in general with railroads be revised.

1912. — Joint Board on Railroad Facilities and Port Development made two reports, recommending legislation to be enacted to permit the

admission and extension into the Commonwealth of the Grand Trunk Railroad.

1912. — Metropolitan Plan Commission recommended creation of a Metropolitan Planning Board to work out plans for transportation lines, facilities, and thoroughfares.

1914. — Boston City Planning Board urged public ownership of all transportation facilities in Metropolitan District.

1914. — Joint Commission of Public Service and Transit Commissions investigated service of Boston Elevated and Bay State Street Railways in Metropolitan District. Commission commented on need of improvements and urged another inquiry to cover all of the Metropolitan street railways, also steam roads.

1915. — Terminal Commission appointed to investigate transportation facilities in the Metropolitan District.

The above investigations were supplemented by a number of special investigations made by permanent boards and commissions. Several of the business organizations of Boston also made independent investigations of this subject.

A conservative estimate of the cost of these investigations by special commissions and committees is $250,000.

While as a result of some of these reports, important steps have been taken to improve the transportation facilities of Metropolitan Boston, there has been a tendency for commissions to get part way into this problem and then to recommend that the work be passed on to another commission to finish.

It would appear as if to this tendency, to the failure of the public to grasp the importance of a speedy and proper solution of the transportation problems, to the struggles between radicals and conservatives, and to selfishness and short-sightedness on the part of the heads of transportation companies, the failure of Boston to make the proper progress in connection with its terminal facilities may be largely attributed.

A study of the reports of the past commissions reveals plainly that there has never been a really broad and comprehensive plan adopted for the proper development of the transportation facilities of Metropolitan Boston.

Water-front Development.

The State was the original owner of the property along the Boston water front outside the high-water mark, but in 1637 flats to low-water mark, or the 100-rod line where the low-water line was further than that from the shore, were granted to shore owners. In the first days of the colony the wharves belonged to the town of Boston and were under the control and management of the "Overseers of Wharves and Cranes." Subsequently the wharves were sold into private hands, the town relinquishing its public control of the "wharves and cranes" because it was held that private competition would be beneficial among wharf property owners as in business.

In 1855 a harbor line was established by the State and the right was granted to extend wharves to this line. But one party, the Boston Wharf Company, acquired rights under this statute.

The Commonwealth filled in and made certain improvements on a part of its South Boston water front and in 1869 it sold 25 acres of this, its most valuable water-front land, to a railroad. This land was taken back by the State in 1871, after the purchasing company had failed, and was sold again in 1880 to another railroad, together with an adjoining parcel of 12 acres.

In 1869 the Commonwealth sold to a second railroad another tract of 50 acres and before this road had finished paying for the parcel, the State agreed (1880) to its transfer to another railroad. At the present time the New York, New Haven & Hartford Railroad Company controls all of these parcels.

Other smaller tracts of land in South Boston have since been sold by the State.

Under an act of the Legislature in 1869, the Commonwealth purchased an area of land along the Fort Point Channel.

In 1873 the State officials and the railroads agreed to develop the South Boston water front. A bridge across the Fort Point Channel was then projected. This was not built, however, until 1908 and does not even yet serve the full purpose it was

intended for, namely, to aid in the development of the South Boston water front.

A purchase of water-front land and flats at East Boston was provided for in 1897 and in the same year the Commonwealth again started to improve the South Boston water front by the construction of the Commonwealth Pier. This pier was finished five years later (1902). The grass grew on it for eight years. Then it was leased to a railroad which made little or no use of it.

In 1910–12 the Fish Pier was built by the State at South Boston at a cost of $801,211.36.

In 1911 the Commonwealth created a new commission, to be known as the Board of Port Directors, for the development of the port. An appropriation of $9,000,000 was made for the work of this Board.

In the meantime, the State acquired more land and flats in East Boston, as well as an old railroad pier site there. It has just begun a preliminary development of these flats. Work has also been begun on a monster dry dock at South Boston.

In 1894 a joint special committee of the City Council of Boston declared in favor of a modern dock system under public ownership. It asserted that at the time no public department, State or municipal, had any supervision over the business of the some two hundred docks at the port of Boston, of their capacity or size or the uses made of them.

Three years later (1897) a Commission appointed to investigate the terminal facilities problem — the State Board on Docks and Terminal Facilities — reported in favor of public ownership of some of the water front and docks, but was emphatically against public ownership of the entire water front.

In 1907 the Harbor and Land Commission opposed the construction and operation of a system of public docks in Boston, as inadvisable at that time, while five years later (1912), the Board of Port Directors advocated the public ownership and con tro of the water front.

Railroad Development at Boston.

The railroad development at the port of Boston (save that respecting the passenger terminals) has been left virtually to the railroads themselves to work out as best suited their respective interests. While the railroads of the State have for years been under public supervision, this has amounted chiefly to the supervising of the operation of the facilities which the railroads themselves thought necessary and provided of their own accord as a dividend making proposition.

Such was the history, in brief, of the development of the terminal facilities of Metropolitan Boston which confronted the Terminal Commission when it began its labors.

Need for Improvements.

No person of intelligence could, even after merely a casual study of this subject, fail to discover that there is and has been for a long time something radically wrong with the transportation system of Metropolitan Boston. The Commission has failed to find a single person with any knowledge of the situation who has not agreed that the present terminal facilities and the general transportation conditions of Metropolitan Boston could and should be greatly improved. Even those who have made it plain to the Commission that they will oppose any effort for the improvement of the conditions in question at this time say that, provided the money could be obtained, provided the proper persons to bear the expense could be determined on, provided the proper method of imposing the expense attendant upon such improvement could be arrived at, and provided, etc., many improvements could and should be made.

But as to what improvements should be made, when they should be made, and as to who should bear the expense of the same, the Commission found a divergence of opinion.

It was found by the Commission that public officials of this State whose duties should bring them in touch with the problems which this Commission considered, hold different opinions respecting the remedies which should be applied to the transportation problems in Metropolitan Boston. What was more

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astonishing, the Commission found that some of these officials did not, apparently, have any definite opinions on the subject.

With regard to fundamentals, the divergence of opinion respecting the development of a port is apparently peculiar to Massachusetts, as the Commission found the opinions of traffic experts elsewhere as to the general remedy to be applied to a situation such as Boston's, very similar. It was plain that, in this respect, the minds of traffic experts elsewhere, stripped of bias, run in pretty much the same channels.

A president of a Massachusetts railroad who appeared before the Commission presented as his sole suggestion for the improvement of the general transportation facilities of Boston the statement that three experts, to be paid $25,000 a year each, should be appointed to investigate this subject. He said that these experts should assemble the previous reports on the subject and that he thought that they could evolve a plan from which all might work.

This Commission had already assembled about all of these reports and abstracts of them were then in preparation. The study which the Commission gave to these made it plain, as has been stated, that one of the reasons for the failure of many of the movements for better transportation facilities in the Metropolitan District, was the tendency to procrastinate. This has marked the history of the investigation of this problem.

Accordingly, the Commission has determined to state its conclusions on the evidence before it, and to make a definite effort to arrest the slip-shod, piece-meal planning process that has characterized the development of the terminal facilities of Metropolitan Boston in the past.

Study of Conditions in Boston.

A study of the terminal conditions of Metropolitan Boston disclosed to the Commission a situation which is exceedingly grave from the standpoint of the advancement and prosperity not only of Boston but of the railroads themselves. The lack of proper co-operation between the railroads, steamship companies and street railways is apparent.

In their struggles for business, the railroads have virtually divided Metropolitan Boston into three zones, and by artificial barriers have, so far as business is concerned, practically dismembered the district commercially. Each railroad has secured control of sections of the Metropolitan District. Each of the three railroad lines jealously guards the territory which it controls and leaves no stone unturned to exclude its rivals from participation in the profits from the business of this territory. The railroad barriers are raised through the medium of non-uniform, unfair, and extraordinarily high switching charges.

These switching charges are made in this way. A railroad hauls freight to Boston and is paid the regular rate for so doing. It will deliver this freight to its own rail or water terminals or sidings without additional charge. If this freight comes into Boston over another railroad, however, and is destined for delivery at one of the terminals or sidings above mentioned, a heavy switching charge is made for the transfer from the point of connection between the two railroads to any of the terminals or sidings of the former road. Thus the freight which arrives at the Boston terminals of the Boston & Albany Railroad, destined for delivery at any of the railroad terminals or sidings in the Boston district, except those of the Boston & Albany, is subject to a heavy switching charge in addition to the rate to Boston. It is also unnecessarily delayed.

The same situation governs the transportation of freight from Boston to other places. If freight is loaded in Boston at a terminal or siding of one road and is to be shipped out over another road from Boston, the railroad on the line of which the freight originates, makes a heavy switching charge for the transfer. Through these charges, each railroad endeavors to keep on its own rails and in its own territory all freight which originates on its lines, or for which it acts as intermediary, and such freight as escapes it and is directed to other lines is heavily penalized. Either the shipper, consignee, or rival road is made to bear this penalty.

The Commission found that the railroads through these switch-charges discriminate against the New England shipper in favor of the Western shipper. As a general rule railroads

absorb the switching charges on freight originating at points west of the Hudson River and north of the Canadian line. All of the roads which participate in the haul prorate the switching charges. The roads do not, however, absorb the charges on freight originating at New England points, or other points east of the Hudson River. The New England local shipper is thus penalized and the shippers in other sections are favored.

The whole system of switching charges at Boston, in addition to having the effect of repressing business, is responsible for a great deal of the street traffic congestion in Metropolitan Boston.

A switching charge situation is one which most cities have had to face in the past and one which many are now facing. The practice of railroads making such charges is in itself common and is a natural and necessary result of competition.

At Boston, however, the situation has many extraordinary features, which work to the detriment of the growth and prosperity of the Metropolitan District and also of the State. The chief of these ills may be divided into five classes: (1) High and non-uniform switching charges. (2) Delay of days instead of hours attendant upon the transfer of freight from the north to the south of Boston. (3) Lack of co-ordination of the freight terminal facilities of the railroads, steamships and trolley lines. (4) An antiquated and rambling freight house equipment. (5) A poor system of handling freight.

Switching Charges.

The efforts of the railroads to force the routing of freight over their lines on penalty of additional expense and delay to the shipper has resulted in extraordinary differences in charges for identical switching service. At one point, namely, East Cambridge, the switching tariffs on freight interchanged between the Boston & Maine and the Boston & Albany Railroads show two different sets of switching rates.

At this point the Boston & Albany Railroad will switch domestic freight which it cannot haul over its lines, to and from the Boston & Maine Railroad for 30 cents a ton, or about $4.50 a car, figuring the average carload as about 15 tons. At this same point, the Boston & Albany Railroad charges for

switching to and from the Boston & Maine freight which it can haul over its own rails if the shippers route the same that way, 60 cents a ton, or about $9 a car. On export and import freight which it can haul over its own rails, the Boston & Albany Railroad charges for switching to the Boston & Maine road at the same point 90 cents per ton or about $13.50 per car, while export and import freight to or from points which its rails do not touch, the Boston & Albany Railroad will switch to the Boston & Maine Railroad for 50 cents per ton, or about $7.50 per car.

The same rates prevail on the Boston & Maine at this point as far as export and import freight is concerned. The Boston & Maine charges 60 cents a ton for the interchanging of all domestic freight with the Boston & Albany Railroad at this point.

At Boston, the Boston & Albany road will switch freight to and from the New Haven road within the switching limits for 60 cents a ton. This includes import and export freight. At Cook Street, Newton, it will interchange with this same road freight to and from competitive points for 60 cents a ton, while on freight to or from non-competitive points, namely, points which its own rails do not reach or from which it could not enjoy the revenue from a road haul, it charges but 30 cents a ton for interchange service.

Another illustration of the difference in switching charges for the same service can be had by a comparison of the switching charges of the Boston & Maine and New Haven roads with the Union Freight Railroad as an intermediary interchange road. Freight which arrives at Boston over the New Haven road, destined for delivery within the switching limits of the Boston & Maine road at Boston is subject to an additional charge of 5 cents a hundred pounds, or about $15 a car, this charge covering the Union Freight Railroad rate of 2 cents a hundred pounds and the Boston & Maine switching rate of 3 cents a hundred pounds.

On the other hand, on the same freight arriving at Boston over the Boston & Maine road for delivery at a point within the switching limits at the New Haven road at Boston, the charge would be 3½ cents additional for switching, this covering

the joint switching rate of the New Haven and the Union Freight. This would be but $10.50 per car.[1]

This 3½ cent rate will cover the interchange service charge as far south as the Southampton Street and Massachusetts Avenue yards. If the freight is destined to Dudley Street, a mile further, or to Bird or Harvard streets, the rate will be 5 cents per hundred pounds. Harrison Square (also in Dorchester) which is in the same zone on another division of the New Haven as far as distance from the point of connection between the Union Freight and Boston & Maine road is concerned, is not in the Boston switching district. It takes a separate rate of its own and is considered a separate shipping point from "Boston." Unless there are through rates between the original point of shipment and Harrison Square, freight brought into Boston over the Boston & Maine road will have assessed against it the Union Freight charges, plus the regular New Haven classified shipping rate from "Boston" to Harrison Square. The same is true of Neponset, Milton, Mattapan, Boylston Street, Roxbury, West Roxbury, Forest Hills, Hyde Park and Readville. The classified rates between Harrison Square and the Boston terminal yards of the Boston & Maine road are as follows: —

	Per 100 Pounds.	Cents.
Class 1,		12
Class 2,		12
Class 3,		11
Class 4,		9
Class 5,		6
Class 6,		6

Thus on first-class freight the charge is more than twice as much on shipments between Harrison Square and the North Terminal yards as the charge on all freight between Harvard Street and the North Terminal yards, while on the two lowest classes of freight (the fifth and sixth) the charge for freight movement between the North Terminal yards and Harrison Square is 20 per cent more than the flat rate between the North Terminal yards and Harvard Street.

[1] Both the New Haven and Boston & Maine will interchange export and import freight by a joint agreement with the Union Freight for 3 cents per 100 pounds minimum weight as per official classification, except in no case carload of less than 20,000 pounds.

Still another illustration of the difference in the switching rates at Boston may be had by comparison of the switching rates of freight originating at points within the switching limits on the various railroads and destined for points of delivery on other roads. A carload of freight originating within the south terminal yards of the New Haven road, destined to a point on the Boston & Maine Railroad, would be switched via the Union Freight Railroad for 3½ cents a hundred pounds, which is the joint switching rate of the New Haven and Union Freight road. This would mean on the average carload a charge of $10.50. The same carload of freight, if it originated a few hundred yards west in the terminal yards on Boston & Albany rails would be switched to the Union Freight road by the Boston & Albany for a flat rate of $2 a car or about ¾ cent per hundred pounds, plus the regular Union Freight rate of 2 cents a hundred pounds. On the average carload of fifteen tons, the Union Freight rate would be $6, which added to the $2 rate of the Boston & Albany would make the total switching charge $8.

If the same carload originated on the Boston & Albany Company's Grand Junction road in Cambridge, and was destined to a Boston & Maine point at East Cambridge, the Boston & Albany would charge either 3 cents per hundred pounds (about $9 per car) or 1½ cents per hundred pounds (about $4.50 per car). Thus the Boston & Albany gets at least $2.50 per car and as high as $7 per car more for the same sort of service on the same kind of freight at East Cambridge than it does at the south terminal yards in the heart of Boston through which pass in a year more passenger coaches than through any other terminal yards in the United States.

If, on the other hand, this carload of freight originated within the switching limits of the Boston & Maine road and was destined for delivery at a point on the New Haven road, the switching charge would be 5 cents a hundred pounds, or $15 a car.

Should the same carload be switched by the Boston & Maine to the Boston & Albany at Somerville or East Cambridge, the charge would be 3 cents per hundred pounds, or $9 a car.

Under the present system the switching limits of the three railroads at Boston embrace an exceedingly small area. The switching limits of the New Haven road do not include the corporate limits of Boston, covering only a narrow strip of the city.

The switching limits of the Boston & Maine extend from Boston to just west of the Everett Junction Tower, Metropolitan Parkway Bridge, west of Wellington, Prospect Street Bridge, east of Union Square, Somerville, and to Gilman Bridge, south of Winter Hill. The limit posts define line between the terminal divisions of the old Portland, Fitchburg and Southern Divisions. Wellington is in Medford.

The switching limits of the New Haven road include the South Terminal yards, the Commonwealth and New Haven piers, and extend over the Midland Division of the New Haven road as far as Harvard Street, Dorchester. The Boston & Maine switching limits include the city's corporate limits on the northerly side of Boston and a narrow fringe of territory just beyond.

The Boston & Albany's switching limits cover its terminal in Boston proper and extend out as far as Beacon Park. They do not include points on the Grand Junction road.

All of this is in marked contrast to the switching limits of Chicago, St. Louis, and other large cities of this country. At Chicago, the inner zone covers an area with a radius of ten miles, while the outer zone extends twenty miles.

Interchange Facilities.

There are three principal points of interchange between the railroads at Boston. The New Haven road interchanges with the Boston & Albany at the South Terminal. The Boston & Albany and the Boston & Maine roads interchange at East Cambridge and East Somerville. Interchange between the Boston & Maine and the New Haven is via the Union Freight Railroad. Some interchanging is done between the New Haven and Boston & Albany at Newton. This, however, is comparatively small.

In the Metropolitan District there is only one freight clearing yard, worthy of the name, where freight cars can be sorted

properly for reshipment or for switching. This is the Boston & Albany Railroad's Beacon Park yard in Brighton. Even this is by no means in every respect a first-class clearing yard.

The New Haven's largest clearing yard is at Readville. Much of the interchanging between the New Haven and Boston & Albany roads is done in the South Station passenger terminal yards at night.

The Boston & Maine has its main clearing yards just outside of the North Station and at Cambridge and Somerville. These yards are totally unfit for the use to which they are put. While they are regularly jammed full of freight, a big tract of land nearby — the old asylum grounds — in Charlestown is unused.

Union Freight Railroad. — The Union Freight Railroad, which has trackage rights on Atlantic Avenue, Commercial, and other streets of the city and which serves about two miles of the principal water front, is a double tracked marginal railroad. It is controlled by the New Haven road with which it has joint switching rates and does a carload interchange business between the three railroads.

This company charges 2 cents per hundred pounds for interchange between the railroads and 1 cent per hundred pounds for interchange between the railroads and any point on its lines. The company has been in existence since 1872. It handles about 29,000 loaded cars a year and in addition about 23,000 empties.

It has one small team delivery and storage yard and another larger yard, in which, however, but few cars can be accommodated on account of lack of trackage. This road operates six engines. In 1889 this road handled 287,780 tons of freight, in 1915 only 512,942 tons. The small volume of business handled by this road shows clearly the inadequacy of its facilities.

The company's service is slow and has occasioned much criticism. Its tracks run through exceedingly busy streets, and in front of the South Station, the Boston, Revere Beach & Lynn Railroad ferry terminal, and the wharves of all of the popular summer excursion steamship companies. This has caused a great deal of complaint from the traveling public, with the result that the operations of this road are limited by ordinance.

Union Freight Railroad Teaming and Engine Yard, Atlantic Avenue, Boston.

During the daytime, the road is not allowed to run trains of more than eight cars each, while at night the maximum number of cars is twenty-five to a train.

Less than Carload Freight. — The railroads of Boston do not interchange freight of less than carload lots, or, as it is called, "L.C.L." freight. All less than carload freight destined to other railroads, to steamships, or to trolley express companies is turned over by the railroads to truckmen to be forwarded. Forwarders officially designated by the railroads handle all the forwarding business except in the case of freight which shippers specifically direct shall be otherwise handled. The charge for this service is 4 cents per hundred pounds between railroad terminals, although in some instances it runs as high as 5 cents per hundred pounds.

Round-about Routes. — Information obtained from the manufacturers showed that the service offered by the railroads entails the shipment of freight over a round-about route, especially on local shipments in the vicinity of Metropolitan Boston. For example, shipments from Lynn to Quincy would normally move via Salem, Lowell, Framingham and Taunton, a total distance of nearly 130 miles; whereas the distance as the crow flies is about fifteen miles. Shipments if in less than carload lots are subject to frequent transfers with their attendant delays. The time consumed on this kind of shipment between Quincy and Lynn was shown to be over a week on the average. This represents only one instance of Metropolitan Boston shipments. There are many combinations, which are subject to a similar round-about and delayed route.

In order to avoid this route, there is the alternative in the case of carload shipments of shipping via Boston, the interchange being made by the Union Freight. For less than carload shipments, the alternative is shipping via Boston, the transfer being made by team between the Boston & Maine and the New Haven freight terminals. The distance via this route between Quincy and Lynn is about twenty miles. It is evident that this latter route is the very one which is responsible for the large volume of team transfer across the city. Furthermore the cost of shipping via Boston is greater, but the time saved is generally considered worth the difference by the

shipper. The time saved via Boston in the case of a Lynn to Quincy shipment would probably be five or six days.

The claim made by the railroads with regard to shipments such as the above is that the service is not better on account of the small volume of business of this class. At a hearing before this Commission a representative of a railroad stated that local interchange between the three railroads within the limits of the round-about route to which reference has been made, amounts to about 23,000 tons per month. However, the feature to be noted is that the figures for such business are low because, due to the very poor service, shipments that would normally move this way are now practically forced through Boston in order to move with anything like a reasonable speed. Thus Boston's streets are congested and pavements worn out by a class of traffic which should never touch this city. In addition to the local business within this outer route, there is a great deal of business to local points from points in the West which strikes this route and is then subject to delays.

An interesting feature of the information secured by the Commission from manufacturers was the light thrown on the time required for the transportation of freight between points within the State and also between Massachusetts points and cities outside of the State.

Manufacturers' communications indicated that it takes longer to transport freight from Lynn to Dedham or Quincy, a distance of about twenty miles, than from Boston to Chicago, a distance of nearly one thousand miles. The same is true respecting shipments of freight between Lawrence or Haverhill and Braintree or Canton; between Lowell and Quincy; between Fall River or New Bedford and Gloucester; and between Worcester and Gloucester. It takes a day and a half longer for the Lynn-Quincy shipments than for the Boston-Chicago shipments. Four days more are required for the Fall River-Gloucester shipments than for the Boston-Chicago shipments, while it takes, according to manufacturers, a day longer to transport freight from Worcester to Gloucester than from Boston to Chicago.

Furthermore, shipments from Needham, Quincy, Waltham, Woburn and Medford take five or six days longer to Chicago than shipments from Boston to Chicago. Shipments to New

York apparently take two or three times as long from local points as those from Boston to New York.

Water Terminal Interchange. — The railroads do not interchange by water at Boston. Only one road, the New York New Haven & Hartford, operates car floats. This road has but two floats in service at Boston and they are used almost entirely by the United Fruit Company. These floats are both small, each having a capacity of eight cars. According to the general freight agent of the United Fruit Company, the floats are not large enough to handle that company's business in an efficient way, nor will the New Haven Company provide floats large enough.

None of the three railroads has lighters in service.

There are three different methods of interchange between the railroads and the steamships: (1) direct from railroad car to steamship and *vice versa*, (2) via teams, (3) via lighters. The ships of all trans-Atlantic lines have direct connections with the railroads. All but two of these lines dock at wharves owned by railroads. Ships of these two lines dock at the Commonwealth Pier. Free dockage is given the steamship companies by the railroads, and in this way the steamship companies enjoy free of charge privileges for which at other ports they pay substantial sums. The railroads bear the burden of carrying and maintaining these piers with a view to making up these losses from the revenue on the freight hauled by them to and from steamships. The Board of Port Directors in a recent report asserted that the export and import business of the railroad companies does not make up for this business and that the domestic freight shippers have to stand considerable of the loss which the railroads sustain by this system of free dockage.

The system of interchange between the trans-Atlantic liners and the railroads at Boston would be ideal if it were not for the fact that the interchange arrangement, coupled with the free dockage system, virtually limits the direct interchange. Steamships which berth at the Boston & Maine docks cannot interchange freely with the Boston & Albany and the New Haven. The heavy switching charge imposed by the Boston & Maine prevents this. The same is true with the water ter-

minals of the other roads. Under an agreement with the Commonwealth which the road is now trying to break, the Boston & Maine must give the Commonwealth Pier, which is tapped by the New Haven road, the Boston rate. It must thus absorb the switching charges to and from the pier. This, the Boston & Maine road does only when compelled, according to a statement which an official of the freight department of this company made to a representative of the Commission.

This official said that the connecting lines will not bear their share of the switching charges to the Commonwealth Pier, but want the Boston & Maine to assume the whole charge of 70 cents a ton. A switching charge of such proportions would, he said, rob the Boston & Maine road of all but a few cents of its share of the revenue on a ton on some classes of goods. He asserted that the Boston & Maine officials warn their connecting roads not to ship over the Boston & Maine for reshipment at the Commonwealth Pier, on penalty of being called on to bear their portion of the switching charges. Instead of shipping freight for the Commonwealth Pier via the Boston & Maine, the connecting roads of the Boston & Maine are urged to have this freight come to Boston via the Harlem River gateway. In this way the freight may reach the Commonwealth Pier without a switching charge being assessed against it. The Commonwealth Pier, however, is thus denied much of the service of one of the State's three railroad lines.

All of the less-than-carload freight to and from the ocean steamships and the railroads is drayed. The coastwise steamship companies all either own or lease their own piers.

One of these companies — the Metropolitan Line — has two car floats and interchanges with these, chiefly with the Boston & Maine. These are the only floats in Boston Harbor, save the two owned by the New Haven road. The company owns five lighters and interchanges considerable of its freight in this way, although a great deal of the freight carried in the ships of this company is teamed to and from its Atlantic Avenue terminal. This company charges 3 cents per hundred pounds (with a minimum of $10 a car) for its car float and lighter service.

The Merchants and Miners Transportation Company, the steamers of which dock at Pier 2, New Haven docks, South

Trolley Freight Terminals at Copps Hill Wharf, Boston.

Boston, and also at Battery Wharf, Commercial Street, during the busier periods, owns eight lighters. It interchanges a large part of its freight with the Boston & Maine via lighters, and charges 4 cents per hundred pounds for the service. Its South Boston Pier is served directly by the New Haven road. Much of the freight of this company is drayed.

The Clyde Line also has five lighters which it leases from the Boston Tow Boat Company. This company does considerable of its interchanging in this way.

In the harbor there are 21 lighters owned by private companies which do a general lighterage business. They are a comparatively small medium of interchange between the steamships and railroads.

Some few of the coastwise steamship companies have connections with the Union Freight road and interchange carload lots with the railroads in this way.

Trolley Freight.

There are but two trolley companies which do a freight business at Boston, — the Bay State and the Boston & Worcester Street Railway companies. Both have terminals at Copps Hill Wharf and are tenants of the Boston Elevated road, which hauls their cars within the limits of Boston and supplies their terminals. For this, the Boston Elevated road is paid on a car basis.

The Bay State Company serves the cities and towns on its lines to the south of Boston and has connections through a steamship company at Providence with New York. The Boston & Worcester Company serves the cities and towns on its lines between Boston and Worcester and has through rates with connecting roads for points beyond, within the State.

Both the Bay State and Boston & Worcester companies interchange with each other and with connecting trolley lines without additional charge to the shipper. Neither road connects physically with any steam road or steamship company, and the freight between the trolley and steam railroads and trolley roads and steamships is all teamed. Neither road makes use of the water facilities of its Boston terminal nor does either inter-

change with the Union Freight, the tracks of which run by the trolley terminal wharf.

These roads do a less than carload business and give quick service for about the same rates as the steam roads. As yet these roads do a comparatively small business.

Boston's Freight Terminals.

The number, location and condition of the freight terminals of Boston are a serious handicap to the progress of the whole Metropolitan District and of the State. There are no less than 49 of these houses for the receipt or delivery of freight in the Boston terminal district alone.

Scattered over miles of territory and equipped with 1,201 freight doors, these freight houses, nearly all of which are antiquated, poorly laid out relics of the days when Boston was the terminus of eight railroads, present an example of inefficiency which is not easily duplicated.

After a journey through these freight yards, which are a maze to the average person and which daily tax to the utmost the memories and ingenuity of the most capable and experienced teamsters, it is difficult for one to understand why either the public or the management of the railroads allow such a condition to exist.

The situation at the Boston & Albany freight terminals, where an old passenger depot is now the largest freight house, is much better than at either the New Haven or Boston & Maine terminals. There at least the main freight houses are not scattered. The Kneeland Street terminals of the Boston & Albany include four freight houses with a total of 164 doors.

At the New Haven freight terminals, where there are twelve freight houses, some of the inbound houses are about a half mile apart, while the outbound houses are sandwiched in between those for inbound freight.

The situation at the Boston & Maine terminals is much worse. The freight houses of this road are scattered from the north end of the city over through Charlestown and East Cambridge. There are thirty-four of these houses for the receipt and delivery of freight.

Freight Handling System.

Under the system in vogue at the Boston railroad terminals, teamsters are required to place their outbound freight at specially designated doors. This means that frequently teamsters are required to visit several doors to deliver a load of freight. In turn this means delay, and naturally tends to congestion. Not infrequently the freight doors are jammed full of freight when other loads arrive, causing more delay. Then, according to the evidence of teamsters, freight after it reaches the freight houses is not usually loaded directly into cars but lies in these houses and frequently is moved once more before being loaded into cars.

The freight which arrives at Boston for forwarding to other railroads or steamships, or which is to be teamed to points in the Metropolitan District, gives a tremendous amount of needless trouble to teamsters and business men, and, according to the testimony of both, causes much confusion and delay.

The supposed location of freight which arrives at the railroad terminals is indicated on freight slips given out at the various railroad freight offices. Teamsters are required to secure these slips and in some instances the freight offices are located at points far distant from a number of the freight houses. Loss of time and useless expenditure of energy results. An illustration of this was witnessed by a representative of the Commission, who saw an intelligent teamster compelled to waste considerable time and to do an unnecessary amount of teaming because he was required to drive to the Warren Bridge to get directions in connection with a case of freight which was at an East Cambridge freight house.

On other occasions a representative of this Commission accompanied teamsters on their rounds of the freight sheds and saw these men forced to waste much time in search of freight because of wrong directions received at freight offices. These directions, however, were apparently the best that the freight clerks could give at that time. Teamsters interviewed by the Commission's representatives declare this to be nothing unusual.

According to the statements of many teamsters — and a representative of the Commission saw illustrations of this —

even after freight is located, it is frequently found buried under other freight. At times teamsters are required to move a ton or more of freight to get at the freight which they seek. This is what teamsters call "digging" freight out. It is a slow process and on some occasions it means that teamsters have to telephone to the offices of their employers to get assistance.

Master teamsters told representatives of the Commission that there is always uncertainty as to where freight which arrives at this city may be found. They say that the situation has become gradually worse during the past five years.

This Commission secured from the letter files of one of the biggest teaming firms of Metropolitan Boston copies of several hundred letters of complaint to the different railroads of the city respecting shipments. The Commission also inspected the replies to these letters. This correspondence was a serious indictment of the conditions which exist at the Boston freight terminals. It told of freight that was days overdue; shipments of which portions were missing; overcharging; freight house confusion and delays, etc.

In one letter the teaming firm inquired as to the whereabouts of a portion of a comparatively small shipment, the rest of which, the letter stated, had been found at several different freight house doors. The numbers of the doors at which portions of the shipment had been found were given in the communication, apparently merely to indicate the vicinity in which the rest of the shipment might be lying.

Unnecessary Teaming.

The lack of co-ordination of the railroad, steamship and trolley terminals forces an immense amount of freight into teams and results in an incalculable amount of unnecessary traffic through the streets of Boston.

An effort was made by the Commission to get an idea of the extent of such teaming for which the present conditions are responsible. For obvious reasons, no accurate figures could be had. A careful canvass of some of the owners and managers of the larger teaming concerns in Boston by representatives of the Commission disclosed, however, some exceedingly interesting

An official of the Master Teamsters' Association told a representative of the Commission that there are between 10,000 and 12,000 horses used in the teaming business in Boston. These are engaged in all sorts of trucking, he said. He stated that there were no statistics to show just how many horses are engaged in forwarding freight from one railroad terminal to another and between the railroads and steamships. He, however, gave to the Commission's representative an estimate of the number of horses so employed. Several other master teamsters and managers of big teaming concerns did likewise. These included representatives of the biggest teaming firms in the city of Boston. In all, ten estimates were secured by the Commission.

The teamsters making estimates enumerated the various big teaming firms and estimated the number of "teams" employed by them in forwarding alone. In the cases of the larger firms these estimates were verified by personal visits. These teamsters also made estimates of some of the smaller firms doing forwarding and the aggregate number of "teams" employed in forwarding by these concerns. The total number of teaming firms which the teamsters asserted do a large forwarding business was about 20, while all agreed that about 20 others do a more or less steady but much smaller forwarding business. Of the rest of the 470 trucking and express firms large enough to have their names appear in the telephone directory, the various teamsters figured that 70 or 80 do some forwarding.

It was agreed that a "team" would average slightly more than two horses. All but two of the teamsters interviewed agreed that a "team" would haul at least 3½ loads a day on an average, and that the average weight of a load would be about three tons. These two placed their estimates of the average team hauls per day at four loads. The average estimate of the number of teams employed daily in the work of forwarding was 391. The estimates indicated that about 1,386 loads or 4,955 tons or 330 carloads of freight are being drayed through the streets between terminals each day. In turn this would mean about 415,800 loads, or 1,486,500 tons, or 99,000 carloads, per year.

Teamsters estimated that 70 per cent. of this forwarded

freight is between railroads, and 30 per cent. between railroads and docks, and between docks and docks.

These estimates do not cover the immense amount of freight that is teamed needlessly to and from railroad terminals and the establishments of various shippers in Metropolitan Boston.

Replies to the Commission's questions sent to manufacturers in the Metropolitan District and interviews between representatives of the Commission and individual manufacturers indicated plainly that manufacturers and other business men of Metropolitan Boston are in the habit of using teams for what might well be less carload interchange business. The shippers say that the expense of teaming freight is greater, but the service is correspondingly better and that time saved is worth the difference.

This is true even on the Grand Junction road, which (from an industrial standpoint) is perhaps the best piece of railroad track in Eastern Massachusetts. This road has direct connection with the Boston & Albany docks and crosses the Boston & Maine road, thus providing direct connection with that road for industries on the Grand Junction. Freight can be switched between this branch road and the New Haven road via the Boston & Albany main line.

Manufacturers on this road told representatives of the Commission that on long haul shipments the Grand Junction service is fairly good, but on hauls of 200 miles or under it is unsatisfactory. The switching charges are apparently largely, but not wholly, responsible for this. Although this road is splendidly situated geographically for rapid and efficient interchange service, inquiry by representatives of the commission among the officials of industries located along this line, showed that the service is slow. Several of these manufacturers stated that in order to save time they have their less-than-carload freight hauled to and from other roads in Boston. One manufacturer whose place of business is located near the East Cambridge station stated that on one occasion it took a week for a consignment of goods to get to Newton.

Thus, although, as it has been stated, it is impossible to get accurate figures on the amount of unnecessary trucking that is done in and about Boston due to poor terminal facilities, it is certain that the amount is tremendous.

Result of Conditions.

The foregoing conditions at the Boston terminals cause a great economic waste.

Citizens of Metropolitan Boston and other parts of the State experience its effects in their pocketbooks. The unnecessary cost and the delay in transportation increase the prices of the commodities affected. As a matter of fact, the latter run the whole gamut of human needs. Taxpayers also experience the effects through their tax bills. The damage done to the thoroughfares of the Metropolitan District alone by these unnecessarily used teams is without doubt very great, while the congestion caused necessitates additional and expensive transit facilities such as tunnels, subways, elevated roads, etc.

Both the business men and the general public suffer from these conditions more than most people are aware — even more than the general run of business men apparently realize. While the public eventually pays the bills, the effect upon the business of the Metropolitan District and of the State is undoubtedly great.

If the loss could be brought home to the business men in dollars and cents, and if the public could be made to realize how much of it is borne by the people of the whole Metropolitan District, the conditions which are responsible would be speedily remedied.

The existence of such conditions in connection with the passenger service would not be tolerated by the traveling public, yet the freight service is the very life of a district like Metropolitan Boston. The more than 1,500,000 residents of the Metropolitan District depend upon this service for nearly every morsel of food they eat, every garment they wear, and almost every other thing which they use in their daily lives.

The safety of these slip-shod and extremely costly methods lies in the fact that they have been in vogue so long that the public is inclined to accept them as a matter of course. Then, too, the burden is distributed so widely that most people do not notice it. It is another case of "what is everybody's business is nobody's business," coupled with the feeling on the part of many that the task of accomplishing the necessary changes is too great.

Boston falling Behind Commercially.[1]

A study of the commerce of Boston as compared with that of the other large cities of the United States shows that Boston is not and has not been of late years holding its own, and that the city which was once the premier port of the United States and which long held a firm grasp upon second position has recently given way to other cities until it is now in fourth place. Official figures show that Boston is comparatively worse off to-day, so far as its proportional share of the total foreign commerce of the United States is concerned, than it was a half century ago, or at any time since then. Boston's commerce has not been actually declining, but the official statistics show that Boston is not going ahead so fast as the other big American cities which are its chief rivals, and that it is thus dropping back in the race for commercial supremacy. This is not due, in the opinion of this Commission, to any natural causes. While Boston is situated some distance away from the great productive sections of this country, much farther away than some of its rival ports, it has many natural advantages which should more than offset this handicap.

Boston is nearer Europe than any other large city in this country. It has a splendid harbor; is nearer the open sea than any other metropolis on the Atlantic seaboard, and is the heart of a great manufacturing section, the skilled labor of which is not excelled anywhere in the world. While the unfair railroad differentials, which give Boston a higher rate from the west than Baltimore and Philadelphia, have undoubtedly worked harm to Boston's commerce, another real reason for the failure of Boston to make the progress it should have made is that the development of the city and Metropolitan District has been badly planned, and that most of such plans formulated have been executed poorly or not brought to completion. Then, too, the people have not been aroused to the necessity for action. What work of development has been accomplished thus far at Boston has had to do almost entirely with a small strip of water-front property.

[1] For statistics on Boston's commerce compared with that of other large cities see Appendix F.

Development of "Rim" of City.

The terminal development of Metropolitan Boston in the past has apparently meant to most of those who have had it in hand, the improvement of the rim of property along the shores of the Metropolitan District. Boston is not and cannot be the narrow strip along the harbor front alone. It is the whole Metropolitan District.

In 1911 the Commonwealth appropriated $9,000,000 for the development of the port of Boston. According to the last report of the Board of Port Directors, all of this money except about $224,000 either has been expended, or is about to be expended, for the improvement of the strip of land along the water front of the city. Not a dollar of this money has been spent for the improvement of the transportation facilities of any other part of the Metropolitan District. The rest of the district has been allowed to develop itself. More than $7,000,000 of the money that has been expended or which it is planned to expend has been used or is to be used for improvements to facilitate the transportation of ocean-going freight.

This ocean-going freight, it was stated in a comparatively recent report of the Board of Port Directors, is about one-twenty-ninth of the freight which the railroads of Massachusetts handle. The whole of the freight which goes over the water's edge at Boston is about 20 per cent. of the total transportation business of the Metropolitan District. The total overseas freight amounts to about half of this, or about 10 per cent. Thus about $7,000,000 has been expended, or is to be expended, chiefly for the improvement of facilities which have to do with about one-tenth of the business of the Metropolitan District. If the State had at the same rate provided for the improvement of the other 90 per cent. instead of letting it improve itself, the expenditures would have totalled about $70,000,000.

While improvement of the wharves and docks of the city, on a broad, comprehensive scale, has been and still is necessary, such improvement alone, without radical changes in the present railroad and street railway transportation system of the Metropolitan District, will avail Boston but little.

Failure to recognize this fact will mean again what it has meant in the past when water-front development which cost the State hundreds of thousands of dollars lay idle for years.

Study of Means of Relief.

With a view to determining what can and should be done to improve Boston, the members of this Commission have given careful study to the history of Boston's development and to the present transportation conditions as described in the foregoing.

At the hearings held by the Commission several suggestions were made for the remedying of the present conditions. Chief among these were a system of lighters and car floats, a so-called belt line to connect the various railroads, and tunnels or comparatively small sections of track to connect the existing tracks. The suggestions respecting tunnels and the proposed new short sections of tracks were for the most part made with a view to effecting a belt line or a partial belt. Thus the two principal suggestions were lighters and car floats and a belt line. Naturally the members of the Commission first turned to Boston to determine what, if any, such facilities were in operation which might form a basis for judgment respecting local conditions.

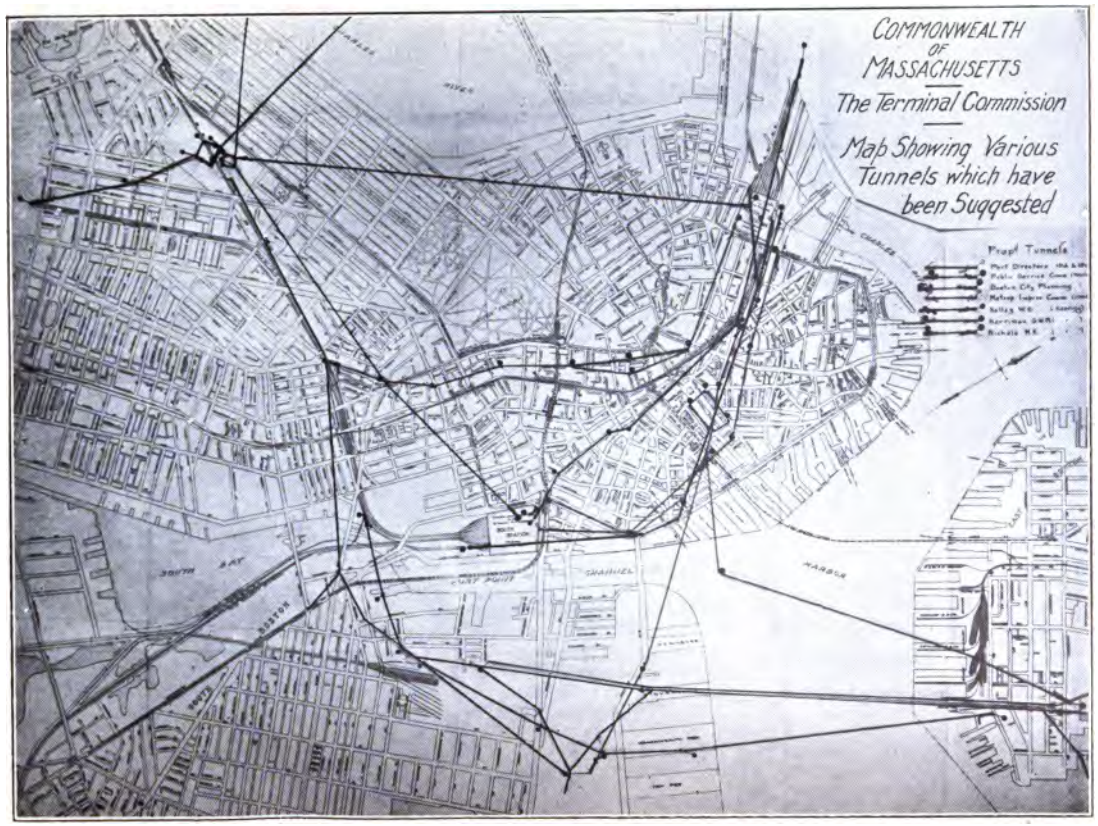
Lighterage and Car Floats.

It was readily seen that so far as lighterage and car floats were concerned, this sort of interchange service is virtually negligible at Boston.

The Union Freight Company, a New Haven road property, and the Grand Junction Railroad which is owned by the Boston & Albany Railroad, are the nearest approaches to a belt line which Boston possesses. Both of these roads are operated for the benefit of the parent roads. Neither gives the service that a properly operated belt line would provide, nor does either serve as the medium of interchange it should be.

The Commission made an investigation of the lighterage service at some of the principal ports of the United States where lighterage is a factor in the interchange of freight.

In New York, where the most extensive system of lighterage



Map showing Various Tunnels which have been suggested, Boston.

is employed, and where it is estimated that there are 11,000 lighters in operation, the Commission found a situation which was entirely different from that of Boston. In the first place, the main portion of the city of New York is located on an island. But one railroad reaches the city proper directly by rail with its freight. All of the other trunk lines have freight terminals on the mainland and ferry their freight across to their New York terminals by lighters and car floats.

For years New York has been working on plans to eliminate the necessity of ferrying in order to get to and from the city. The New York officials have been successful in eliminating to a very large extent the ferry from the railroad passenger service of the city by means of tunnels and bridges. A number of the able officials and business men of the city have long been hoping for the evolving of a plan whereby the use of car floats and lighters for freight service could be greatly lessened.

All New York railroads absorb the lighterage charges to and from New York City. New York's only freight yard is responsible for this. The railroad operating this yard naturally gives the freight brought into it the New York rate, and this has compelled every other railroad company to do the same, even though they have to bear the extra car float and lighterage expense. The usual charge for lighterage as pro-rated is 3 cents per hundred pounds although it is claimed that the actual cost runs to 3.75 cents and 4 cents in some instances.

At Philadelphia the greater part of the interchanging is done by two of the three railroads over the Philadelphia Belt Railroad and other connections, the third railroad doing a large interchange business via car floats and lighters.

At Baltimore, there is also an extensive lighterage service. The officials state that freight is not extensively interchanged between the railroads in this way.

Investigations of the Commission of the lighterage and car-float service at these and other large ports of the United States disclosed little that would appear to warrant the hope that the establishment of a lighterage system at Boston would of itself permanently remedy the present interchange conditions. The increasing of the present lighterage facilities in Boston harbor is, however, desirable and should be encouraged.

Belt Lines.

The other suggestion made at the Commission's hearings for a remedying of the freight terminal conditions was that a belt line be constructed for the purpose of providing a cheap and convenient means of interchange of freight between the railroads and between the railroads and the industries. This was also given a great deal of study by the Commission. The subject was taken up from two standpoints: (1) the facilitation of interchange operations between the railroads to give rapidity, elasticity and cheapness of service; (2) industrial development.

The Commission also considered this subject with regard to the military defenses of the Metropolitan District and consulted with the United States Engineer officer in charge of this district. The latter, after examining the Commission's maps, authorized the Commission to state that, in his opinion, any properly constructed belt line along the lines of that suggested by the Commission, would greatly improve the military defenses of the Metropolitan District.

It was found by the Commission that at all of the larger cities of the United States belt lines are either in operation or are contemplated, and that the ablest traffic men in this and other countries agree that belt lines are great aids to the commercial, industrial and railroad development of a city.

There are three different classes of belt lines in this country, as far as ownership and operation are concerned: (1) publicly owned and operated, (2) publicly owned and privately operated, (3) privately owned and operated. All three were studied and the advantages and disadvantages of each considered.

Of the 49 cities of the United States from which data were secured by the Commission, there are belt railroads in 21, while in 6 other cities belt lines are contemplated. The Commission visited 9 cities, including the four largest in the United States. In 8 of these cities belt lines are in operation, while in the ninth a belt line is contemplated. The officials and prominent business men of each of these 8 cities pointed with pride to their respective belt lines and freely asserted that upon these belt roads much of their hopes for the prosperity of their respective municipalities were based.

Chicago. — In Chicago, which is the greatest railroad center in the world, the Commission found five belt lines in operation. City and railroad officials and traffic experts told the members of the Commission that without these belt lines the railroads of Chicago could not efficiently handle the tremendous volume of business which converges at that point. One of these belt roads, the Belt Railway of Chicago, serves as the principal medium of interchange of carload freight at that city. This road operates a monster clearing yard that has a capacity of 10,000 cars a day. The charges of this road amount to $6 a car when the freight originates with the belt company and about $4.50 a car when the belt company acts as intermediary. The railroads enjoying the road haul absorb these charges.

Without going into the functions of all the belt roads at Chicago, it might be well to mention that another of these roads, the Chicago Junction Railway, operates universal freight stations where freight for any of the railroads serving Chicago may be left. This company will sort freight left at its stations and deliver it to the railroads that are to haul it. The charge for this service is $1 per ton. The railroads absorb the charge and the shipper gets the flat Chicago rate. This sort of thing is unknown in Boston. In Chicago where the shipper has a siding, the belt company takes his less than carload shipments direct from the siding and forwards them for the flat Chicago rate. If the shipper has not a siding, he teams his freight to the nearest universal receiving station and his shipments are unloaded there. But one door need be visited. He gets the flat Chicago rate, plus, of course, the teaming cost to and from the universal station. In Boston the shipper not only has to haul his shipments to different railroad terminals, but must have these shipments delivered at specified doors. Part of a load of merchandise might have to be delivered at all three Boston terminals and at two or more doors of each terminal. Here the shipper is required to pay teaming charges of 4 cents and 5 cents a hundred pounds in the city proper and where the hauls are long, as they are in many instances, the charge is higher.

New York. — In New York where the city has expended about $130,000,000, and is engaged in the spending of many

millions of dollars more, to develop the freight terminal facilities, the officials, who are as keen and as well versed in transportation knowledge as any in the world, are turning their eyes toward the development of a marginal freight road on the Brooklyn shore.

Philadelphia. — In Philadelphia, where with a contemplated expenditure of approximately $25,000,000 the city and railroad officials are jointly engaged in extensive port improvements, the backbone of the development is, according to city officials and officials of business organizations, the Philadelphia Belt Line Railroad.

The Philadelphia Belt Line Railroad, which is a semi-public property, was incorporated in 1891 by a group of public-spirited citizens who were alarmed at the danger of railroad monopoly of the water front. A majority of the stock of this road was placed in trust for the city. This stock is voted by trustees, the majority of whom are elected by the principal business organizations of Philadelphia. The road does not do an operating business. It has a charter which permits it to lay its tracks to any portion of the important water front of Philadelphia and it has tracks which extend along about 7 miles of this frontage. Through the belt road and its charter, any road in Philadelphia is enabled to gain entrance on an equal basis with other railroads to any portion of the Philadelphia water front. The railroads themselves have paid for the greater part of this trackage. They operate the same and pro-rate the expense, charging each other for interchange from $2 to $4 a car for a two-way movement.

In connection with the recent agreement between the railroads and the city, whereby the terminal improvements which are to cost approximately $25,000,000 are to be made, the Belt Line principle was endorsed. The agreement included provisions for the extension of the tracks along the water front of two of the railroads and also for the extension of the belt line tracks and the application of the belt line principle to the track extensions of the two railroads in question. It is asserted by the city officials of Philadelphia that prior to the establishment of the belt, the railroads virtually divided the city against

itself and that the interchange of a freight car was a rarity. They say that the Belt Line has made the railroads more tolerant of each other and easier to deal with. The business organizations of the city of Philadelphia advertise the belt railroad as one of the city's greatest advantages, and state that there is nothing like it on the northern seaboard.

Baltimore. — The city of Baltimore is expending $2,000,000 on marginal streets and a belt railroad which is intended to connect all of the railroads in that city. While this road is now operated for only about 1¼ miles and at present connects with but one of the three principal railroads, the officials of that city told the members of the Terminal Commission that the belt and the highway have already done much to develop a section of the city which had remained industrially stagnant for fifty years. The principal marginal street in Baltimore is known as the Key Highway.

St. Louis. — Two belt railroads were found by the Commission in St. Louis. Both are operated by the Terminal Railroad Association of that city. This is a regularly incorporated company which does a passenger and freight terminal business, and its stock is held by the fifteen companies which it serves. The association has been in existence upwards of two score of years. It does not pay any dividends; its profits are put into equipment when receipts exceed expenses, and any deficit if not made up by future business is pro-rated among the owner companies. The officials of this road told the Commission that between 75 per cent. and 80 per cent. of the freight business of St. Louis is handled by this association and that the tracks of the association belt line extend 25 miles beyond the station. The association does an interchange business between all the railroads and maintains warehouses for the receipt and delivery of less than carload lots, and terminals for the receipt and delivery of carload lots. It also does an interchange business between various industries located along these tracks and those of the railroads. It handled on an average 10,120 freight cars a day in 1914, and a total of 3,693,996 cars for the year.

It was stated by the officials of this association that one of

its belt lines was built in 1903 and that at the close of the World's Fair in 1904 there was not a single industry on it. The belt line now has between 35 and 40 industries located on it, and does a business of three hundred cars a day between these industries. It was built on swamp land worth about $100 an acre; parts of it are now worth $5,000 an acre, according to the officials of this association. These officials say that the industries have increased the valuation of the city, given employment to many people, and stimulated the growth of the city's business.

Kansas City. — Kansas City also has a belt line in operation, and the officials of the controlling company expressed the belief that in the not distant future this road will prove a boon to that city.

New Orleans. — In New Orleans, where $25,000,000 is being expended in the development of the water-front facilities, the city officials, and officers of the local traffic association told the members of the Commission that the backbone of the transportation improvements of the city of New Orleans is the public belt railroad which is owned and operated by the city. The water front of that city is being developed by a State commission. This development is being accomplished on a broad scale and little is being left undone to make New Orleans one of the great ports of the world; yet the traffic experts in that city publicly declared to members of the Terminal Commission that these extensive water-front improvements would be of comparatively small value to the city were it not for the fact that the great docks and wharves that have been and are being constructed there are and will be served by a public belt railroad, which will permit all railroads serving New Orleans to obtain access to the New Orleans water front on an equal basis and at a minimum expense. The public belt road of New Orleans is under the direction of an unpaid commission of 17 persons, 11 of whom are appointed from the membership of the commercial organizations of the city, and 5 appointed by the mayor from the city at large. The mayor is ex officio president of the corporation. This road has about 40 miles of track and is to be extended. It has 10 miles of double track along the principal section of the water front, where it has

exclusive track connection with all of the public wharves. In 1914 it had a net operating surplus of $63,064.15. The first $500,000 used for the construction of this road was appropriated from the city treasury. A bond issue of $2,000,000 was authorized for the construction of the road and about $1,000,000 of this has been thus far expended. The earnings of the belt line are supposed to pay the interest charges and to pay off the bonds as they come due.

In New Orleans the city officials stated to the Commission that the public belt road which operates its own engines charges but $2 a car for interchanging. The officials stated that prior to the establishment of the public belt railroad, the railroads of that city "were at each others' throats," as it were, and charged as high as $20 a car for interchange service.

In addition to affording the railroads prompt and impartial service, the public belt of New Orleans has, according to the officials of that city, attracted industries to the city. City officials say that they are confident that it is destined to become a tremendous factor in the industrial development of their municipality.

San Francisco. — At San Francisco there is a public belt road in operation. This road, the officials have stated in a letter to the Terminal Commission, is on a paying basis. It is owned and operated by the State under the jurisdiction of the Board of Harbor Commissioners of San Francisco. It was constructed in 1890–92 and its main line is 6.7 miles long, while its spur, industry, and team tracks extend over 19.1 miles. The officials of the Board of Harbor Commissioners in a letter to the Terminal Commission stated that the shippers of San Francisco can now send a car from one end of the water front to the other for $5, whereas previously this operation was performed by the railroad companies via barge and cost $10 and $15 per car.

There are in all 115 different industries located on the tracks of the San Francisco belt, while other industries not having spur track connections use the belt tracks and pay a cash rental per car per day, according to the officials of the Board of Harbor Commissioners. The latter in communications sent to the Terminal Commission said that undoubtedly many industries

located in San Francisco because they were assured of the belt railroad service. The road handled in 1914, 230 cars a day. In 1913 the belt railroad was extended at the request of the military authorities, through the Fort Mason Military Reservation to serve the United States army transport docks at the north of that reservation. An extension from the transport docks to the Presidio, one of the largest military reservations in the United States, is contemplated. The charges of the belt road run from $2.50 to $5 a car.

Dallas. — The Commission learned that Dallas, Tex., one of the progressive cities of the southwest, is among the cities in which much attention has been given to the terminal question. Dallas retained two of the best known experts in the United States in their respective professions to make a study of the conditions of that city: Messrs. John F. Wallace, chairman of the Chicago Railway Terminal Commission, and George E. Kessler, landscape architect of St. Louis and Kansas City.

Both experts, who made separate studies, recommended among other things the construction of a belt line at Dallas. Mr. Wallace stated in his report that a belt line would tend to develop the city of Dallas, and that it would draw industrial and warehouse properties to its tracks.

Detroit. — In the city of Detroit there has been a comparatively recent awakening respecting the necessity of adequate terminal facilities. Seven million dollars has been expended since the latter part of 1912 for the improvement of the railroad facilities. The traffic of this city became badly tied up during the winter of 1912 and it was discovered that while the industrial development of Detroit had increased tremendously in the previous decade, the terminal facilities had not kept the pace and were inadequate to handle the volume of business thrust upon them.

A traffic expert was secured and, as a result of the recommendations made by the traffic commissioner, great improvements were begun. Heads of industries expended large sums of money to aid in this work, which is still continuing. As a result of the work that has been done in that city, there are two belt lines there, one an inner and the other an outer belt. The latter swings in a circle around the outskirts of the city for a distance of 17 miles.

Houston. — The city of Houston, Tex., which the Commission inspected while on its way to New Orleans, also has a belt line. There, too, although the city is located on a tiny river far inland, the municipal officials were found to be awake to the necessity for modern and efficient terminals. The city is constructing docks and warehouses along this stream, which is hardly larger than a good-sized creek. Railroad tracks have been laid by the city to connect with these docks. The railroads, the officials state, were very anxious to construct these tracks themselves. The city officials, however, would not give to any railroads the sole right of direct access to any of the municipal properties that were being developed. The ambitious scheme of development and the intelligence with which it is being carried out deserve a great deal of commendation.

Portland, Ore. — At Portland, Ore., the Commission of Public Docks has commenced to lay tracks on one side of the Williamette River to serve the publicly owned docks of that city. The Dock Commission expects to commence the operation of terminals there in a very short time. It has been pointed out to this Commission that the harbor of Portland, Ore., is not now suffering to any great extent respecting the interchange of freight, because of the fact that the different railroads entering the port can use all tracks jointly, all freight is handled at a union terminal point and the different railroads own part of the harbor on equal terms.

Seattle. — In Seattle the County Commission which has jurisdiction over the port facilities, after making several attempts to induce the railroad companies to construct belt lines, has taken steps to construct the first unit of a public belt road. This information is contained in an official communication from that Commission to the Terminal Commission.

Los Angeles. — The Harbor Commission of Los Angeles has laid tracks on the different wharves owned by the city and has entered into an agreement with the Pacific Electric Company to switch cars over these tracks, as well as along other parts of the harbor for the same charge per car.

Indianapolis. — At Indianapolis the belt line is owned by the Indianapolis Union Railway. It serves all railroads and performs interchange service between them and also serves

many industries. The carload interchange switching charge is between $2 and $3 a car. On through traffic, the line enjoying the road haul assumes the expense, but on local traffic, to and from junction points, the charge is added and paid by the consignee at destination, according to officials of the Indianapolis Chamber of Commerce.

Akron, Ohio. — In Akron there is a belt line which is owned jointly by the Pennsylvania, Baltimore & Ohio and Erie roads. This road connects with five different railroads of the city. It charges $2, $3 and $5 a car for the switching service, depending on mileage, the switching charge being absorbed by the carrier.

Officials of that road declare that the road has fostered industrial growth and has tended to increase the traffic of the railroads. They state that the road interchanges approximately 9,000 cars a month, and the percentage of the interchange at this city handled by the road is increasing very rapidly.

Montreal, Can. — At Montreal the only Canadian city visited by the Commission, the same keen understanding of the proper methods to promote the advancement of a city that is evidenced in the more progressive cities of this country, was apparent. The water front of this city is under the jurisdiction of a Federal board. The officials of this Federal Commission, after having visited the principal ports of the world, are enthusiastic advocates of the belt railroad. The Montreal public belt road which extends along the harbor front was constructed by the Board of Harbor Commissioners a number of years ago. At first the railroads were allowed to operate it jointly. As a result of the quarreling between the railroads, it was finally decided by the Commission to take over the work of operating this belt road themselves. This venture, the Commissioners stated, has proven a success and the belt railroad has tremendously aided the phenomenal growth of this great port. It is on a paying basis financially.

This road charges $2.50 a car for interchanging between the ships and the railroads and $5 a car for interchanging cars between the railroads. Officials say that they can do this work much cheaper than the railroads can do it themselves, and that for the same service which they render the railroads for $5 a

ailroads have charged each other as high as $15 a car.

According to statements of the Montreal harbor officials, not a single complaint regarding the movement of freight has reached the Commissioners since the establishment in 1907 of their traffic department, which operates the terminals. Respecting this, a Montreal official said, "And what this means can be readily appreciated by your Commission, as the efficiency and despatch of a port depends more upon this fact than upon any other. Inefficiency spells congestion in a very short time."

The Harbor Commissioners and railroad officials met by the members of the Terminal Commission were inclined to smile at the terminal facilities of Boston, with which they are familiar. They suggested that Boston could learn much from San Francisco, New Orleans and other American cities, particularly the two former.

A *high* official of one of the Canadian roads publicly declared to the Commission that in order for Boston to secure proper terminal facilities there should be a few "railroad funerals."

In their report for 1915, which has just been issued, the Montreal Harbor Commissioners, than whom there are no more progressive respecting port development, have this to say: "The operation of the railway terminals has proved to be one of the most important and successful features of the development of the Harbour of Montreal."

Respecting the Public Belt Railroad this same report says: "The rates charged by the Harbour Commissioners for this service are so moderate and the existing facilities and manner of operation give such good despatch that there is an immediate urgent demand by the new industries rapidly springing up along the water front for the prolongation of the harbor terminals to new sites and to industrial wharves specially being constructed.

"Probably no feature of harbour development will give such good results to the industrial growth of the city and at the same time to the success of the harbour."

Other Belt Roads. — There are also "belt" roads in Birmingham, Buffalo, Chattanooga, Louisville, Cleveland, Denver, Des Moines, St. Joseph, Toledo and Quebec, Can. These roads

perform belt railroad service, although some of them are not strictly belt roads. A number of other cities also have partial belts owned by railroads.

Belt Roads planned.

Belt roads are under contemplation at Jersey City, Dayton, Newark and Cincinnati.

Jersey City. — Jersey City officials plan a public belt railroad. This proposed road is advocated by local business men's organizations. The plan is to lay the tracks of this road along a large part of the more important water front, connecting all of the railroads in the city. It is estimated that the road will cost $1,500,000. This road is advocated on the ground that it will increase the ratables by at least $50,000,000, that it will attract industries and people to Jersey City, and also that it will save time and money to manufacturers, provide additional freight for the railroads, and substantially help the development of the city.

Dayton. — At Dayton it is planned to secure a belt line which will entirely encircle the city by the construction of connecting links between the railroads.

Newark. — In connection with the development of the port of Newark, which includes the building of a system of docks, the reclaiming of meadow lands, etc., the city plans to construct a municipal terminal railway. Under a special act of the Legislature, Newark has been authorized to expend upwards of $2,000,000 in the construction of the first unit of this development. The proposed belt road was advocated on the ground that it would serve the industries which the officials of that city believe will locate on the meadow lands which are now being reclaimed by the city.

Vancouver, B. C. — At Vancouver, B. C., arrangements are just being closed up with the different railroads, whereby they will operate a belt line around that harbor.

Development of Terminal Facilities in Other Cities.

The Commission has thus found that at all of the larger ports on the Atlantic and Pacific coasts of the United States, except Boston, there are in operation, under construction, or about to be constructed, so-called belt lines. This is also true of the largest port on the Gulf of Mexico and of the largest Canadian ports on the east and west coasts of Canada, respectively.

This country's largest interior cities also have belt lines, as have some of the smaller cities. Other municipalities, both coast and interior points, plan to construct such railways.

Cities which have belt lines invariably advertise them as one of their assets from the standpoint of business advantage. San Francisco officials have repeatedly pointed with pride to their belt line and have declared that as yet New York with all of its commercial advantages cannot boast such a line.

On the other hand, the traffic experts of New York do not propose to let this situation continue and they have been working for a belt line for years. Only the fact that they had to get authority from the State and that this caused much delay prevented the construction of the Brooklyn belt road years ago. They have decided on the location of the proposed Brooklyn public belt, and when the Commission visited New York, the officials of that city pointed this location out and asserted that the proposed belt road is one of the most needed improvements at that port.

New Orleans city officials proclaim their belt line as the backbone of their terminal facilities, while the Key Highway at Baltimore, over which the public belt tracks of that city run, is a source of great satisfaction to the officials of that city. The officials of Montreal say that they believe that their city is the best equipped port on the North American continent, and they assert that the Public Belt Line is the key to their whole terminal system.

It is plain to the members of this Commission that the officials of most of the larger American cities are not only keenly alive to the necessity for modern railroad and steamship terminals, but to the fact that to get efficiency of service there must be a co-ordination of steamship and railroad terminals.

All of the larger cities, interior points as well as those on the coast, are expending large sums of money in developing their transportation facilities. This was true also abroad before the war.

An interesting feature of this development is that unlike in Massachusetts, the taxpayer has not been called upon to pay the burdens of terminal development in some of the other States. For instance, $51,000,000 has been expended on the port of San Francisco by public officials, yet not a dollar of this has been taken out of the public treasury. The port pays its own way.

At New Orleans the $25,000,000 which is being expended on the water-front development and all but the first $500,000 expended on the Public Belt Railroad has been or will be raised and paid off, the officials say, without any financial aid from the taxpayers as such.

There has been about $25,000,000 expended on the harbor of Montreal. According to the Montreal officials, the public treasury has not had to bear the burden of any of this.

All that the officials of those cities have asked is that the public credit be loaned for the purpose of financing the improvements. Then they make the terminal facilities carry the debt.

The ownership of the water front of two of these cities lies in the State, while the water-front ownership of the third — Montreal — lies in the Dominion government. In this respect, the situation at these ports is radically different from that at Boston.

For years the city of New York has been gradually acquiring its water front. It has issued [1] $132,000,000 in dock bonds for the development of its water-front facilities and, according to statements of its officials, $68,500,000 of this has been expended for the construction of piers and bulkheads including 9 miles of bulkhead. In the year 1914 the total gross revenue of the Department of Docks and Ferries was $6,177,233.10, while the total audited expenditures amounted to $4,495,730.22. Many millions of New York's terminal development debt has been paid off.

[1] Appendix F gives information as to amount of money spent in the port development of various cities.

Philadelphia has expended $16,602,661.37 to date on terminal facilities, and but $1,507,943.46 of this has been contributed by the State.

Baltimore has expended more than $10,000,000 in the developing of its transportation facilities, including the expenditure for the construction of its public belt line.

While San Francisco and Seattle are the farthest advanced of the Pacific ports as far as the development of terminal facilities is concerned, every other port of any consequence on the west coast of this country is rapidly improving its transportation facilities.

Los Angeles, originally an inland city by something slightly over a score of miles, did not up to a few years ago present much promise of ever becoming a seaport. The people of that city determined, however, to make their municipality a seaport and they have. In order to do this, in 1906 they brought about the annexation of a strip of territory a quarter of a mile wide from Los Angeles to the limits of the seacoast towns of San Pedro and Wilmington. In 1909 to gain control of San Pedro harbor, Los Angeles consolidated with the two towns in question. A breakwater has been constructed at San Pedro which is two miles long and cost $3,038,703. As the result of the consolidation, Los Angeles has pledged itself to expend $10,000,000 on harbor improvements in ten years after 1909, or $1,000,000 a year.

Portland, Ore., has already expended about $2,400,000 on port development, while the Commission of Public Docks at that city has a comprehensive plan of development which, it is estimated, will cost nearly $15,000,000 to carry out.

Boston has done Little.

While the States of Louisiana and California are developing the ports of New Orleans and San Francisco, respectively, and a county commission is developing Seattle, all of the other big American cities are doing most of their own terminal facilities development work. New Orleans, despite the $25,000,000 development scheme which is being put through by a State Commission, has not been content to stand idly by. The city officials on their own initiative constructed a municipal belt line.

The city of Boston has done little to help its own development. Although it has had to bear about a third of whatever the State has expended on the port of Boston, its total expenditures in connection with the terminal development of the port in the last quarter of a century would hardly equal the amounts expended for such improvements in some of the comparatively small western cities in the past few years. Boston's share of the $9,000,000 appropriation made by the State in 1911, only about two-thirds of which has as yet been actually expended, will be about the same as was expended to build a breakwater alone at Los Angeles.

Conclusions.

During the last twenty years at almost every session of the Legislature there have been submitted plans, either by commissions or by the railroads, looking toward the radical improvement of the railroad terminal facilities in and about Boston. Several hundred thousand dollars have been expended in the making of reports and preparation of plans by State and municipal commissions and committees, without substantial result. Attempts of the railroads to build tunnels, or otherwise to remedy, in whole or in part, the evils which every one admits exist, have all come to naught.

A few years ago the Chamber of Commerce and other organizations and business men, together with the newspapers of this city, were much exercised over the lack of facilities and conditions of service then existing. Nothing has since been done to remedy the troubles. To-day members of the Chamber of Commerce are meeting almost daily suggesting remedies, and nothing has as yet been done.

Unless all these complaints are without merit; unless the movement three years ago for better facilities was unreal and not the result of the actual condition, then there is great need of improvement in Metropolitan Boston transportation matters.

The financial condition of the railroads is admittedly such that no great expenditures can be expected from them in the immediate future. Be the cause what it may, the fact remains that the New Haven Railroad, being obliged by mandate of the United States authorities to sell a large amount of its securities

at a probably heavy sacrifice, is not in position to make large expenditures at the moment, and our own Public Service Commission now urges the sale of other securities at great additional loss.

The Boston & Maine Railroad can hardly be expected under present conditions to expend small sums, much less large sums of money, in view of the present depreciated value of its stock and of the forced sale of the majority of its stock by order of the Attorney-General of the United States.

It is therefore evident that if the shippers of Boston and of New England are to have any relief from the embargoes which are being placed upon our railroads whenever business becomes brisk; if the shippers are to have better facilities, the railroads cannot be expected to raise the money under present conditions. Private persons who have been granted railroad or electric railway franchises of late years have not exercised their rights. Must we then endure our present disabilities until the roads can become, if ever, financially strong, or until private individuals get ready to act?

This Commission believes that much ought to be done and that some relief can be had at little expense; that the jealousies which have heretofore shown themselves in the treatment of the transportation problem ought to cease; that if there can be no actual combination of transportation facilities, there ought at least to be co-operation; that the shippers themselves ought to aid in every way possible in the needed relief, and that what the railroads cannot do because of their financial condition, the Commonwealth itself ought to do. The Commission therefore makes the following suggestions.

Recommendations.

Northern Avenue Bridge.

First. — Northern Avenue bridge was constructed to carry railroad cars. Tracks a few hundred feet in length, connecting the Union Freight Railway with the South Boston yards of the New Haven Railroad, would make the Commonwealth Pier of much greater use; would relieve the South Terminal of much congestion, would materially reduce the time and delays of transporting freight across the city, and should be built at once.

For years this construction has been delayed because the city authorities and the railroad officials have been unable to agree upon the terms to be imposed for the use of this avenue and bridge, to the building of which the State contributed $260,000. This disagreement should no longer be permitted to deprive all the shippers of freight of the use of the bridge. We recommend the passage of an act substantially as submitted herewith. (Appendix A (1).)

Freight Handling and Switching Charges.

Second. — The freight houses of the various railroad terminals in Boston have been improved but little, if any, during the last fifteen years; nothing apparently has been done for several years. The handling of freight in these houses is less systematic than elsewhere in large cities. The houses themselves are less conveniently located than elsewhere. Freight cars are used by consignees as storage warehouses when the demurrage charge is less than the cost of warehousing. Every unnecessary delay in handling freight on the part of the railroad or of the merchant tends to stagnation and congestion of transportation, and deprives the entire community of facilities to which they are justly entitled. When cars are used for storage the entire community suffers for the benefit of the individual.

The New England manufacturer is at a disadvantage with the manufacturer out of New England by reason of the switching charges in Boston. These charges for similar service are absorbed by the railroads under some conditions and not under other conditions. The railroads demand for similar services different switching charges under seemingly similar conditions. There should be uniform and reasonable charges, to the end that the shipper may no longer be at a disadvantage because of the location of his place of business on one railroad rather than upon another.

There should be a careful study made of this entire problem by our Public Service Commission and a comprehensive plan should be prepared for a uniform switching charge; for the handling of freight at the railroad freight yards and freight houses for the better economy of the railroads, and the saving of unnecessary delay to shippers and consignees.

Northern Avenue from Atlantic Avenue, showing Approach to Bridge.

The Public Service Commission apparently has power under the law to enforce the necessary changes, but it has done nothing as yet. It should act at once.

This Commission recommends the passage of a resolve substantially in the form submitted herewith. (Appendix A (2).)

Atlantic Avenue Elevated Structure.

Third. — The elevated structure in Atlantic Avenue was built to permit the carrying of railroad cars, including Pullman. It was intended to be so used. In New York a connecting railroad is being built at an expense of more than $25,000,000; connecting railroads exist elsewhere. Why should we not use the facilities we have? No definite steps have been taken for the use of this elevated structure by railroad cars, and this Commission has been without a sufficient appropriation to prepare plans for such use, but these tracks ought to be so used if possible, and we recommend the passage of the accompanying resolve. (Appendix A (3).)

Co-operation between Steam and Electric Roads.

Fourth. — Both the steam and electric railroads have the power to carry passengers and freight, and yet there is no co-operation looking to the use of each system for the performance of the functions it is best fitted to perform. Such co-operation is necessary, and we recommend the passage of a resolve substantially as submitted herewith. (Appendix A (4).)

Belt Line Railroad.

Fifth. — If the Union Freight Railroad, Grand Junction Road, and the Atlantic Avenue elevated tracks were all used to the fullest extent that public convenience and necessity would permit, if the handling of freight at the freight houses were made more systematic, still congestion would be relieved only in part. The problem of handling passengers and freight at the terminals of the great cities of this country is the most serious problem that confronts the railroads at the present time. The president of the New Jersey Board of Commerce and Navigation stated a few days ago in an address that "before many years pass one gigantic terminal company will

be operating all the railroads and terminal facilities within a radius of twenty-five miles about Manhattan." Many of us believe that the problem in Boston can only be permanently solved in this way.

This Commission is not prepared at this time to recommend so radical a departure from the existing conditions. The attempted unification of the railroads of New England has been stopped by order of the government. Even if we were agreed that the unification of the terminal systems in and about Boston were wise, it is doubtful whether, under the Federal law, such unification would be permitted.

While we disagree as to the advisability in combining in one corporation all the transportation facilities either of New England or of Metropolitan Boston, we all do agree that there should be greater co-operation, and that ease in transporting freight from one system to another is a necessity.

To this end a belt line beginning at a point near the Saugus River on the Eastern Division of the Boston & Maine Railroad, located within a radius of twelve miles from the State House, and terminating at Readville on the New York, New Haven & Hartford Railroad, would connect all the railroads entering Boston. The switching charges and the delays at transfer points could be largely eliminated by the construction of such a belt line having proper classification yards and other facilities. Much of the congestion in the streets of Boston could also be eliminated by such a line.

Plans for such a belt line have been prepared by several commissions, but nothing has been done. A franchise for a portion of such a belt line was granted to the Southern New England Railroad Company in 1912, but no action has been taken. The property adjoining such a belt line would be the natural location for industrial and manufacturing plants of all kinds, and the history of belt lines in other cities is proof of the statement.

This Commission has had tentative plans prepared for such a line and preliminary estimates have been obtained. Portions of existing roadbeds can be utilized. It seems clear that the cost of construction will be considerably within $10,000,000, and that a reasonable route can be easily fixed within twelve miles of the State House. All the railroads now or hereafter

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system should be developed by the railroad companies between the railroad water terminals.

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ACKNOWLEDGMENTS.

The comparatively short life of this Commission has been attended by a tremendous amount of detailed work, in the accomplishment of which the Commission has received much aid from the officials of the various cities of the United States and Canada.

It would not be easy to conceive a more cordial or more whole-hearted series of greetings than those given to the members of the Terminal Commission as representatives of the Commonwealth of Massachusetts by the officials of the nine cities which its members visited, and also by the officials of the business organizations and railroad companies in those cities.

In every city visited, busy men gave freely of their time to help this Commission in its work of investigation, and the members of the Terminal Commission wish to acknowledge the debt of gratitude they owe these officials.

The Commission has made free use of the statistics and other data compiled by the various public bodies of other cities and of the reports of the past and present Boards and Commissions in this State. From these, much valuable information has been obtained, not a little of which is incorporated in this report.

The Commission is indebted to the officials of the forty-three other cities in this country and Canada who assisted the Commission in securing information relative to their respective municipalities, and to the officials of the commercial organizations of these cities.

To the officials of the cities and towns, of the business and improvement associations, and of railroad, street railway, and steamship companies of this State who aided the Commission in its work; to those who appeared at the Commission's hearings, and to others who have contributed to the information accumulated, this Commission also wishes to extend its thanks.

The Commission desires to express its deep appreciation of the loyal and efficient services rendered by Mr. Edward J. Dunn, its secretary, and Mr. John B. Babcock, 3d, its engineer assistant.

JAMES F. CAVANAGH, *Chairman.*
MARTIN HAYS.
HERBERT A. WILSON.
FRED P. GREENWOOD.
ROBERT ROBINSON.
CHARLES M. SPOFFORD.
LUKE D. MULLEN.
FREDERICK H. PRINCE.
WILLIAM H. COOLIDGE.

A true copy. Attest.

EDWARD J. DUNN,
Secretary.

APPENDICES.

APPENDIX A.

PROPOSED LEGISLATION.

(1) AN ACT RELATIVE TO THE NORTHERN AVENUE BRIDGE.

Be it enacted, etc., as follows:

SECTION 1. The Union Freight Railroad Company is hereby authorized to extend its tracks from a point in Atlantic avenue across the Northern avenue bridge to a connection with the tracks of the New York, New Haven and Hartford Railroad in South Boston, upon such terms and conditions as to operation as the public service commission, after hearing, shall determine. Said railroad company shall make such payment to the city of Boston and the commonwealth of Massachusetts for the use of said bridge as shall be determined by the public service commission.

SECTION 2. This act shall take effect upon its passage.

(2) RESOLVE DIRECTING THE PUBLIC SERVICE COMMISSION TO INVESTIGATE THE CAUSE OF DELAYS IN HANDLING FREIGHT IN BOSTON.

Resolved, The public service commission is hereby directed to investigate forthwith the method of receiving and delivering freight in the freight houses in the city of Boston; and the causes of delays in the loading and unloading of freight cars; also the charges made by the railroads for switching cars in metropolitan Boston; and to take the necessary steps and to make appropriate orders to the end that delays may be diminished, congestion relieved and charges made uniform.

(3) RESOLVE DIRECTING THE PUBLIC SERVICE COMMISSION TO INVESTIGATE THE USE OF THE ATLANTIC AVENUE ELEVATED STRUCTURE FOR THE TRANSFER OF RAILROAD EQUIPMENT.

Resolved, The public service commission is hereby directed to investigate the condition of the elevated structure in Atlantic avenue, Boston, in order to ascertain the feasibility of the use

fixed charges, including interest on funded and unfunded debt, if any, and to make provision for a sinking fund for its bonds.

SECTION 7. Any railroad company operating a railroad which now connects, or hereafter may connect, with the property of the Belt Line Company, shall have trackage rights thereon and have the right to use its facilities without unjust or undue discrimination, paying therefor tolls and charges fixed by the directors of said Belt Line Company.

SECTION 8. The Belt Line Company shall have the rights, privileges and powers, and be subject to the duties and obligations conferred and imposed upon railroad corporations by the general law, except as herein otherwise provided.

SECTION 9. The intention of this act is that the Belt Line Company shall be, and it is hereby authorized and empowered to expend the proceeds of the bonds authorized in section five of this act for the construction and equipment of a public Belt Line Railroad system in and for metropolitan Boston, including tracks, sidings, switches, spurs, crossovers and all appurtenances and accessories thereto; the building of depots, roundhouses, warehouses, sheds, stations, classification yards, signals and all other necessary structures incident to the construction and equipment and operation of railroads; for the purchase of locomotives, switch engines, cars and other necessary rolling stock; for the payment of property purchased or appropriated for the purpose of laying tracks, sidings, switches, spurs, crossovers, etc., or for the erection of necessary structures and buildings incident to railroads; for the purchase of existing roadbeds, tracks, switches, sidings, spurs, crossovers, or for the appropriation of the same; for the purchase of barges and tugboats and other property incident to the operation of a barge system; and generally for the purchase and equipment of all property, movable and immovable, necessary and proper to construct and equip and operate said public belt railroad system, and as incident thereto, a barge system.

SECTION 10. The Belt Line Company, and any other railroad company connecting therewith, may use with its own motive power the tracks of any other railroad company for the purpose of transporting freight to and from the water front of metropolitan Boston, upon such terms and conditions as the public service commission may prescribe and permit: *provided, however,* that all trains while on the tracks of any railroad shall be subject to

its control and direction in such manner as shall be approved by said commission, and the charges of such railroad for transportation and for terminal accommodations of freight going over said railroad to and from said Belt Line Company may be fixed by the public service commission.

SECTION 11. This act shall take effect upon its passage.

APPENDIX B.

INSPECTION TRIPS OF COMMISSION.

In accordance with votes of the Commission, and with the consent of the Governor and Council, the Terminal Commission made three separate trips to inspect the terminal facilities of other cities. The secretary of the Commission accompanied the party as did also an official of the Sergeant-at-Arms Department as disbursing officer.

The cities visited by the Commission were New York, Chicago, Philadelphia, St. Louis, Baltimore, New Orleans, Kansas City, Houston, Tex., and Montreal, Can.

WESTERN AND SOUTHERN TRIPS.

The first trip of the Commission consumed two weeks, the Commission leaving Boston on August 19 and returning on September 2. During this trip, the terminal facilities of Chicago, St. Louis, Kansas City, Houston and New Orleans were inspected. The schedule of this trip was as follows: —

Lv. Boston, Thursday, August 19, 12.30 P.M.
Ar. Chicago, Friday, August 20, 9.45 A.M.
Lv. Chicago, Sunday, August 22, 11.59 P.M.
Ar. St. Louis, Monday, August 23, 7.49 A.M.
Lv. St. Louis, Tuesday, August 24, 11.45 P.M.
Ar. Kansas City, Wednesday, August 25, 7.45 A.M.
Lv. Kansas City, Wednesday, August 25, 10 P.M.
Ar. Houston, Friday, August 27, 7.30 A.M.
Lv. Houston, Friday, August 27, 8 P.M.
Ar. New Orleans, Saturday, August 28, 9.20 A.M.
Lv. New Orleans, Monday, August 30, 8.05 P.M.
Ar. Chicago, Tuesday, August 31, 10 P.M.
Lv. Chicago, Wednesday, September 1, 12.40 P.M.
Ar. Boston, Thursday, September 2, 11.55 A.M.

Immediately after its arrival in Chicago, the Commission took up a program which had been arranged for it by the municipal authorities, Chicago Association of Commerce, Chicago Railway

Terminal Commission, and officials of the various railroads in Chicago. This program began with a conference between the members of the Terminal Commission and the Chicago Railway Terminal Commission at the latter's office. At this conference the members of the Commission explained the terminal conditions of Chicago, together with the problems that confront that city, and outlined the improvements proposed.

Prof. W. F. M. Goss of the University of Illinois, representing the Chicago Association of Commerce, Committee of Investigation on Smoke Abatement and Electrification of Railway Terminals, addressed the Commission at this conference, explaining the work of his committee, which at that time had been engaged for about four years in the investigation respecting the advisability and feasibility of smoke abatement and the electrification of Chicago railroads.

The Commission was entertained at luncheon on the day of its arrival in Chicago by the Chicago Association of Commerce. In the afternoon the Commission visited the new $5,000,000 municipal pier on Lake Michigan and the new Northwestern Station. In the evening the Commission met a number of the most prominent railroad officials in Chicago, many of whom discussed the railway terminal problems, not only of Chicago but of various other cities in the country.

The following day (Saturday, August 21) the Commission, accompanied by a number of city and railroad officials, inspected the freight yards and sheds of Chicago, going over the tracks of the Belt Railway Company, Chicago Junction, and other roads, through the stock yards and through the central manufacturing district. The Commission had the use of a special train which was placed at its disposal by the Chicago railroad officials.

Sunday, August 23, the Commission inspected the Soo Terminal and spent part of the day looking over the freight and railroad yards of the city. The Commission left Chicago Sunday night and arrived in St. Louis next morning.

An hour after its arrival in St. Louis, the Commission, accompanied by city and railroad officials, began its work of inspecting the St. Louis Union Station, the two belt lines, the clearing yards of both East and West St. Louis, the river ferries and various railroad connections of that city. A special train was placed at the disposal of the Commission by the officials of the Terminal Railroad Association of St. Louis.

On Tuesday, August 24, the Commission inspected the Cupples Station, a great business terminal located in the heart of the city. The Commissioners took luncheon at the St. Louis City Club as guests of that organization, and in the afternoon continued their inspection of the railroad facilities and the river front.

The Commission left St. Louis the same evening (Tuesday, August 24), arriving in Kansas City on the morning of Wednesday, August 25. On its arrival, the Commission at once began the inspection of the stock yards and various main arteries of travel through the city, the railroad yards and belt line connections. The latter were inspected with the aid of a special train which the Commission used through the courtesy of the Kansas City Terminal Railway Company.

The Commissioners were the guests at luncheon of the city officials and of the alumni of the Massachusetts Institute of Technology. The same evening the Commission left Kansas City for Houston, Tex., arriving at the latter city on the morning of Friday, August 27.

Accompanied by city officials and members of business organizations, the Commission spent the day inspecting the terminals, belt railroad, and also the water-front improvements that were under way in that city. A special train was placed at the disposal of the Commission by the Belt Railway Company officials. The same evening the Commission left Houston for New Orleans, arriving in that city the following morning (Saturday, August 28).

Shortly after its arrival the Commission, in company with the Board of Commissioners of the Port of New Orleans, inspected the river front, the docks and freight houses along the same. In the evening the Commission met Mayor Behrman and other city officials of New Orleans, and also representatives of local traffic and business organizations, at a dinner tendered the Commission by the Mayor. At this function the Mayor and other officials of the city described the history, accomplishments and methods of operation of the public belt railroad of New Orleans.

The following day the Commission inspected the proposed canal route to Lake Pontchartrain, an arm of the Gulf of Mexico behind the city. On Monday, August 30, the Commission inspected the railway terminals of New Orleans and the public belt railroad. That evening the Commission left for Chicago, arriving there the following night (Tuesday, August 31).

On Wednesday morning, September 1, the Commission in-

spected the freight tunnel (Chicago Tunnel Company and Chicago Warehouse and Terminal Company) and left Chicago for Boston at noon that day.

Eastern Inspection Trip.

The second inspection trip of the Commission began on Sunday, November 7, and ended on Saturday, November 13. During this inspection tour the terminal facilities of New York, Philadelphia and Baltimore were inspected by the Commission. The schedule of the trip was as follows: —

Lv. Boston, Sunday, November 7, 5.34 P.M.
Ar. Baltimore, Monday, November 8, 8.35 A.M.
Lv. Baltimore, Tuesday, November 9, 5.32 P.M.
Ar. Philadelphia, Tuesday, November 9, 7.50 P.M.
Lv. Philadelphia, Wednesday, November 10, 5 P.M.
Ar. New York, Wednesday, November 10, 7 P.M.
Lv. New York, Saturday, November 13, 1 P.M.
Ar. Boston, Saturday, November 13, 6.10 P.M.

The Commission left Boston on the evening of November 7 and arrived in Baltimore the following morning. Shortly after its arrival, the Commission took up a schedule that had been prepared for it by the officials of the city, of commercial organizations and representatives of the railroads. This included an all-day trip along the water front on one of the city steamers, during which the various water terminals of the city, the railroads and a number of industries were inspected.

The following day the Commission, in company with representatives of the city, business organizations and railroads, inspected the municipal marginal highway and belt line and also the various railroad terminals of Baltimore. The Commissioners were the guests at luncheon on this day of the Baltimore Board of Trade.

The Commission left Baltimore for Philadelphia on the evening of this day, where shortly after their arrival they were the guests at dinner of Mayor Blankenburg and other city officials. The following day the Commission, in company with officials of the city, commercial organizations and railroads, inspected the Philadelphia water front and the railroad terminals of that city. That evening the Commission left Philadelphia for New York.

On Thursday morning, November 11, the Commission, in company with Mr. Irving T. Bush, President of the Bush

Terminal Company, inspected the great terminal of that company in South Brooklyn and the site of the proposed new public belt railroad, which is to extend along the South Brooklyn water front.

Later in the day the Commissioners were presented to Mayor Mitchel and other city officials of New York, following which the Commissioners inspected the Grand Central Terminal. On Friday, November 12, the Commissioners as guests of the Hon. R. A. C. Smith, Dock Commissioner of the city of New York, and in company with a number of other city officials and representatives of business organizations, inspected the water terminals of New York. The Commission was entertained at luncheon by the New York Board of Trade.

Canadian Inspection Trip.

The third inspection trip of the Terminal Commission consumed two and one-half days. The Commission left Boston on the evening of December 8 and returned on the morning of December 11. The schedule of the trip was as follows: —

Lv. Boston, Wednesday, December 8, 8.30 P.M.
Ar. Montreal, Thursday, December 9, 3.15 P.M.
Lv. Montreal, Friday, December 10, 9.30 P.M.
Ar. Boston, Saturday, Dec. 11, 8.05 A.M.

The original schedule of the Commission provided for a trip of two days, but owing to a railroad accident which held the Commission up several hours, the Commission was unable to complete its work and return to Boston as originally arranged.

Montreal was reached by the Commission at 3.15 P.M. December 9. Within ten minutes after its arrival, the Commission took up a schedule which had been arranged by the officials of the city, Board of Harbour Commissioners, business organizations and railroads. An inspection of the water front and of the Harbor Belt Railroad was made by the Commission on the afternoon of its arrival. A special train was given over to the use of the Commission through the courtesy of the Board of Harbour Commissioners.

That evening the Commissioners were the guests at dinner of the Harbour Commissioners, and the following day made an inspection of the railroad terminals and clearing yards of Montreal and of the Mount Royal Tunnel. A special train was placed at the disposal of the Commission by the officials of the

Canadian Pacific Railway. The Commission inspected the Mount Royal Tunnel, as guests of the Mount Royal Tunnel and Terminal Company, from one of the tiny work trains which were being operated in that great bore.

That evening the Commissioners were the guests, at dinner, of the city of Montreal. Immediately following the dinner, the members of the Commission left for Boston, arriving in this city the next morning.

Appendix C.

BRIEF STATEMENTS OF FREIGHT TERMINAL AND INTERCHANGE CONDITIONS IN THE MORE IMPORTANT CITIES OF THE UNITED STATES AND CANADA.

Data respecting cities of the United States and Canada, except the cities of New York, Chicago, Philadelphia, St. Louis, Baltimore, Kansas City, New Orleans, Houston and Montreal, which the Commission visited, were furnished by city officials and responsible officers of business organizations and in some instances by railroad officials. (*These data were originally presented in the present form to simplify the study which the Commission made of the belt lines and other terminal facilities of the cities in this country and Canada.*)

Boston, Mass.

Population, 1910, 670,585; 1915, 745,439.

Belt Line. — No.

Since 1875 there have been various plans and suggestions made by commissions and individuals for a belt line to connect the railroads entering Boston. None of these, however, have materialized.

Other Methods of Interchange. — All of the railroads have their own freight terminals and do most of their own interchanging.

The Union Freight Railroad, a corporation which is controlled by the New York, New Haven & Hartford Railroad Company, has trackage rights over Atlantic Avenue, Causeway and other streets along a portion of the main water front.

This road does an interchange business between all of the railroads and serves a number of industries and wharves. It maintains its own engines and has two small yards.

Considerable of the freight from and to Boston is interchanged at points a number of miles outside of Boston, where the switching charges are comparatively low and where usually,

on through freight, there is no charge for the interchanging, as both roads get a road haul and absorb the switching charges.

In Boston the Boston and Albany Railroad and the New Haven interchange at the South Terminal yards, much of this being done at night. The New Haven and the Boston & Maine interchange via the Union Freight Railroad, and the Boston & Albany and Boston & Maine interchange by the Union Freight road and by the Grand Junction road at East Cambridge and Somerville. Almost all of the interchange business at Boston between these two latter roads, however, is done via the Grand Junction road. This road extends from the Boston & Albany main line at Cottage Farm through East Cambridge, East Somerville, Everett, Chelsea and East Boston, to the Boston & Albany piers in East Boston.

The interchanging done by lighters and car floats is comparatively small. There are but four car floats in the harbor, two of which are owned by the New Haven road (capacity eight cars each) and two by the Metropolitan Line (capacity eight and nine cars respectively). The New Haven floats are used chiefly by the United Fruit Company to interchange freight between the sides of their steamers and the New Haven docks in South Boston.

In all there are but 20 lighters in the service of the steamship companies at the port of Boston. Eight of these are owned by the Merchants & Miners Transportation Company and five by the Metropolitan Line. Five are leased from the Boston Tow Boat Company by the Clyde Line, and two are owned by the Ocean Steamship Company (the Savannah Line).

There are four companies which do a general lighterage business, — the Merchants Steam Lighter Company, the T. A. Scott Company, the McKie Lighter Company and Betts Bros. & Co. These companies have a total of 21 lighters in service in the harbor.

There is no direct interchanging between the railroads or steamship companies and the Bay State and Boston & Worcester street railway companies, the only trolley lines doing a freight business at Boston. This is true despite the fact that the Boston terminal of the trolley companies is located on a wharf on the main harbor front, at the head of which are the tracks of the Union Freight road.

The trolley companies interchange with each other without charge, however, and also interchange with their connecting

lines without an interchange charge and without receiving any allowance in the freight rate for the same. The freight carried by these trolley companies that is billed to or from railroads is transferred in teams.

Interchange Charge. — The interchange charge between railroads at Boston varies from 1 cent per 100 pounds with a minimum of $3 per car to 5 cents per 100 pounds with a minimum of $10 a car. This applies within the "switching limits." These limits do not extend by any means to the corporate limits of the city; for instance, Harrison Square, Dorchester, is not within the switching limits.

The freight switched between Harrison Square and the Boston terminals of the other railroads is subject to the regular classified rate, the charge varying with the classification. The classified rates between Harrison Square and the Boston & Maine yards are as follows: —

	Charge per Hundred.	Cents.
Class 1,		12
Class 2,		12
Class 3,		11
Class 4,		9
Class 5,		6
Class 6,		6

The other shipping points in the city and Metropolitan District which are not in the switching or terminal district are also subject to the local classified rates, which vary considerably.

The car float and lighterage interchange charge at Boston is also varied. The New Haven railroad company charges for its car float service between the United Fruit Company's pier and its own docks at South Boston a flat rate of $6.50 per car. The Metropolitan Line charges for both lighterage and car float service 3 cents per hundred pounds. The minimum charge on this car float business is $10 a car.

For lighterage service the Merchants and Miners Company charges 4 cents a hundred pounds with a minimum of 15 cents a package. The Clyde Line, for lighterage, charges from 2 cents to 10 cents per hundred pounds, according to classification. The Savannah Line, which uses its lighters chiefly for transferring shipments of lumber, will lighter such cargoes from its ships to Boston docks for the flat Boston rate. On lumber to be shipped through to inland points, this company charges 25 cents per

thousand feet for lightering and loading on railroad cars. It usually employs other lighters for transferring cotton and other merchandise to railroad water terminals and pays for this service $2\frac{1}{2}$ cents per 100 pounds.

The charges of the four companies doing a general lighterage business depend very largely upon the class and weight of shipments, distance of haul, number of bridges to be passed through, and also upon the conditions of the lighterage business. (The prices are apt to depend upon the volume of business and rates are likely to be less in slack than in busy times.)

Generally the lighterage charges of these companies range from 1 cent a hundred pounds for very low class freight to $6\frac{1}{4}$ cents a hundred pounds for some of the other classes of freight.

The interchange charge for freight transferred between the trolley companies and the railroads and steamships is 4 cents per hundred pounds, this service being performed, as has been stated, by teams.

As a general thing, the railroad lines absorb the switching charges on freight to and from the west or points west of the Hudson River or Canada, but do not absorb the charges on freight to or from New England points. The railroads allow the trans-Atlantic steamship companies the free use of their water terminals and depend upon the receipts from the road hauls to make up for their wharfage losses.

The following gives more in detail the switching charges of the respective roads: —

New York, New Haven & Hartford Railroad.

The New Haven road charges for switching to the Boston & Albany Railroad as follows: —

To or from public delivery tracks or at private sidings of the Boston freight terminal including sidings and yards to and including Harvard Street siding, export, import, or domestic freight to or from the Commonwealth Pier, the New Haven docks and wharves, 3 cents per hundred pounds or 60 cents per ton, net or gross; the minimum charge is $6 per car. Where freight is loaded or unloaded by the New Haven company's employees, the charge is 25 cents per net ton extra. In connection with all freight to or from the Commonwealth Pier, a State wharfage charge of 10 cents per ton is assessed. Other switching charges made by this company applying to shipments

received or forwarded over the company's rails are as follows: on freight in carloads placed for delivery on any private siding on the Boston freight terminals including sidings and yards on Boston division to and including Harvard Street siding and ordered to be switched to any other location in the Boston switching district, a charge of $2 per car is made. For secondary switching, namely, the second setting of a car to finish loading or unloading, a charge of $2 a car is made. This also applies on cars switched to or from connecting lines. Carload shipments, on which the New Haven has had the road haul and which have been placed on public delivery tracks, are switched to the Union Freight Railroad or the Boston & Albany Railroad free, if the order to do so is given within 24 hours after placing, and provided bulk is not broken. Outbound less than carload shipments of 6,000 pounds or more loaded by shippers on private sidings requiring rehandling at transfer stations of the New Haven, but not requiring rehandling by the station force at point of shipment are switched from private sidings or point of interchange of connecting line without charge. The New Haven company switches cars received or to be forwarded over its own rails, on shipments of six thousand pounds or over, to and from industries, free of charge.

On freight in car loads arriving in Boston over the New Haven company's rails, unloaded into freight houses and ordered by owners to storage warehouses or private sidings served by the rails of that company, a charge is made of 60 cents per net ton, with a minimum of $6 a car. Under the New Haven company's schedule the "Boston Freight Terminals" embrace the following yards, freight houses and piers: New Haven docks 1, 2, 4, Pier 5 (Commonwealth), 6 (Fish); bulk yards Nos. 1, 2, 3, 5, 7 (South Terminal); Southampton Street yard; Massachusetts Avenue yard; freight houses Nos. 1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12; also all private sidings extending from any of the yards named; also public and private sidings north of Harvard Street, including Dudley, Bird and Harvard Street sidings.

The following freight deliveries are also located within the corporate limits of Boston, all independent of the Boston Freight Terminals, each being a separate freight station: Harrison Square, Neponset, Mattapan, Fairmount, Readville, Hyde Park, Forest Hills, Boylston Street, Roxbury and West Roxbury. Dorchester, which is also located in the corporate limits of Boston, is not a freight station, although the following freight deliveries

are located in Dorchester: Harrison Square, Neponset, Milton and Mattapan.

The joint switching tariff of the New Haven and Union Freight railroads, applying in either direction, on freight in carloads except export and import (unless otherwise stated) to or from points of connection between the Union Freight Railroad and the Boston and Maine or deliveries on Atlantic Avenue, Boston, and the New York, New Haven & Hartford Railroad Company, including Commonwealth Pier, is as follows: —

(1) To or from yard, tracks, or private sidings north of First Street, Piers 1, 2, 4, Pier 5 (Commonwealth), Pier 6 (Fish), also the Massachusetts Avenue yard and Southampton Street yard.

(*a*) To or from Boston & Maine Railroad connection 3½ cents per hundred pounds or 70 cents net or gross ton, minimum charge $7 a car. Where freight is loaded or unloaded by the New Haven employees, the charge is 25 cents per ton extra.

(*b*) To or from Atlantic Avenue, 3 cents per hundred pounds or 60 cents per net or gross ton, minimum charge $6 per car.

(2) To and from Harvard Street, Bird and Dudley Street sidings and private sidings between the Harvard Street siding and the Massachusetts Avenue yard.

(*a*) To or from the Boston & Maine Railroad connection, 5 cents per hundred pounds or $1 per net or gross ton, minimum charge $10 per car.

(*b*) To or from Atlantic Avenue deliveries, 4 cents per hundred pounds or 80 cents per net or gross ton, minimum charge $9 per car.

The New York, New Haven & Hartford and Union Freight railroads joint freight tariff of switching charges applying on export and import freight of all kinds in straight or mixed carloads, minimum weight as per official classification, excepting in no case carload of less than 20,000 pounds, from or to point of connection with the Boston & Maine Railroad at Boston, to or from the Boston terminal yards, Commonwealth Pier, to or from New York, New Haven & Hartford docks, 3 cents per hundred pounds or 60 cents per ton, minimum charge $6 per car.

The New Haven switches considerable of its export freight destined for the Boston & Maine and for export at the Boston & Maine docks at Northampton, where the Boston & Maine absorbs the switching charge for the line haul. The New Haven hauls but little western freight destined for Boston & Albany points or Boston & Albany docks, owing to the fact that its

connecting lines have not traffic arrangements that would encourage this sort of thing. What does come from the west destined for Boston & Albany points is usually consigned to nearby points. This, together with the export freight brought in over New Haven rails for export at the Boston & Albany docks, is interchanged at the South Terminal yards.

Boston & Albany Railroad.

The Boston & Albany interchange rates for switching within switching limits to or from public delivery tracks or private sidings and connecting lines at points mentioned, on all freight except coal and coke, are: —

Kneeland Street and Huntington Avenue deliveries to or from the New York, New Haven & Hartford Railroad, 60 cents per ton, net or gross, minimum $6 a car; Kneeland Street and Huntington Avenue, to or from the Union Freight Railroad, $2 a car. Cars arriving at Boston over the Boston & Albany Railroad (no part of which has been unloaded), ordered to connecting lines of Boston or to Albany terminals, are switched without charge. The Boston & Albany makes a charge on switching to or from the Boston & Maine Railroad at East Cambridge, Mass., or Cambridgeport, freight destined to or coming from points on or via the Boston & Maine to or from which through rates are in effect, 60 cents per ton; on shipments on or via the Boston & Maine Railroad to or from points on which no through rates are in effect, 30 cents a ton. At East Somerville, the Boston & Albany makes a charge for interchanging to or from points on the Boston & Maine with through rates in effect, 60 cents a ton; points where no through rates are in effect, $4 a car.

At Newton the Boston & Albany makes an interchange charge on all switching to or from the New Haven road on freight received on which through rates are in effect, 60 cents a ton; and on freight on which no through rates are in effect, 30 cents a ton.

On import freight in carloads, minimum weight 20,000 pounds, destined to points on or via the New Haven, to which no through rates are published, a switching charge of 3 cents per 100 pounds is made. On import freight in carloads to points on the Boston & Maine from East Cambridge, to which no through rates are published, a charge of 2½ cents per hundred pounds is made; while to points on and via the Boston & Maine Railroad to

which through rates are published, 4½ cents per hundred pounds is charged.

The Boston & Albany's switching limits cover its terminal in Boston proper and extend out as far as Beacon Park. They do not include points on the Grand Junction road.

Boston & Maine Railroad.

The Boston & Maine road makes a charge for switching all freight between track connections with the Union Freight Railroad, the Boston & Albany Railroad and sidings, private side tracks, and regular delivery tracks within the switching limits, including Mystic Wharf, Hoosac Wharves, point of interchange with the United States Navy Yard, Charlestown, Park Street siding, and certain industries, of 3 cents per hundred pounds, minimum carload 20,000 pounds. On fruit for delivery at fruit sheds received from the Union Freight Railroad or the Boston & Albany Railroad, the Boston & Maine makes a charge of $10 a car. On export and import freight in carloads billed via the Boston & Maine Railroad at regular divisions to be delivered to Hoosac Wharves or Mystic Wharf, free of switching or wharfage charges, except 3½ cents per hundred pounds, terminals to be paid or allowed the Boston & Maine on live stock (except sheep, on which actual expense governs): (*a*) '5,000 pounds or more from points on the Boston & Maine Railroad is switched free to the Boston & Maine docks; (*b*) less than 5,000 pounds is subject to cartage charge without wharfage.

For switching between the Hoosac Wharves or Mystic Wharf and connection with the Grand Junction branch of the Boston & Albany Railroad when from or to points that cannot be reached by the Boston & Maine Railroad or connections, under its local or joint tariffs, the charge is 2½ cents per hundred pounds. This includes loading and wharfage of package freight; additional charge for loading bulk freight, including pig iron, 15 cents a ton, gross or net. From or to points by the way of lines other than the Boston & Maine Railroad when such points can be reached by the way of the Boston & Maine under its local or joint tariffs, the charge is 4½ cents per hundred pounds; and switching between the Hoosac Wharves and Mystic Wharf and Union Freight Railroad, 3 cents per hundred pounds. The lighterage charge on package freight from Boston & Maine docks to Boston & Albany docks is 3 cents per hundred pounds, including handling and rehandling.

The switching limits of the Boston & Maine extend from Boston to just west of the Everett Junction Tower, Metropolitan Parkway Bridge, west of Wellington, Prospect Street Bridge, east of Union Square, Somerville, and to Gilman Bridge, south of Winter Hill The limit posts define line between the terminal divisions of the Old Portland, Fitchburg and Southern Divisions.

The Union Freight Railroad Company.

The Union Freight has six engines but has no other equipment. The road has a teaming track yard leading from Atlantic Avenue at Commercial Wharf, which has a capacity of about 14 cars. This yard is also used as a storage yard for engines of the road. The teaming tracks are used largely for the delivery of produce. The road does but little through business for the Boston & Albany. Superintendent Grosvenor, who has been with the road for thirty years, says there are not more than three or four through cars a year from the Boston & Albany hauled over his road, although there is a lot of local delivery from the Boston & Albany.

This road charges 1 cent per 100 pounds for service to or from any of the railroads and any of its Atlantic Avenue connections, with a minimum of $3 per car and 2 cents per 100 pounds for through service between the North and South terminals yards, with a minimum of $4 per car. This road hauls carload shipments only.

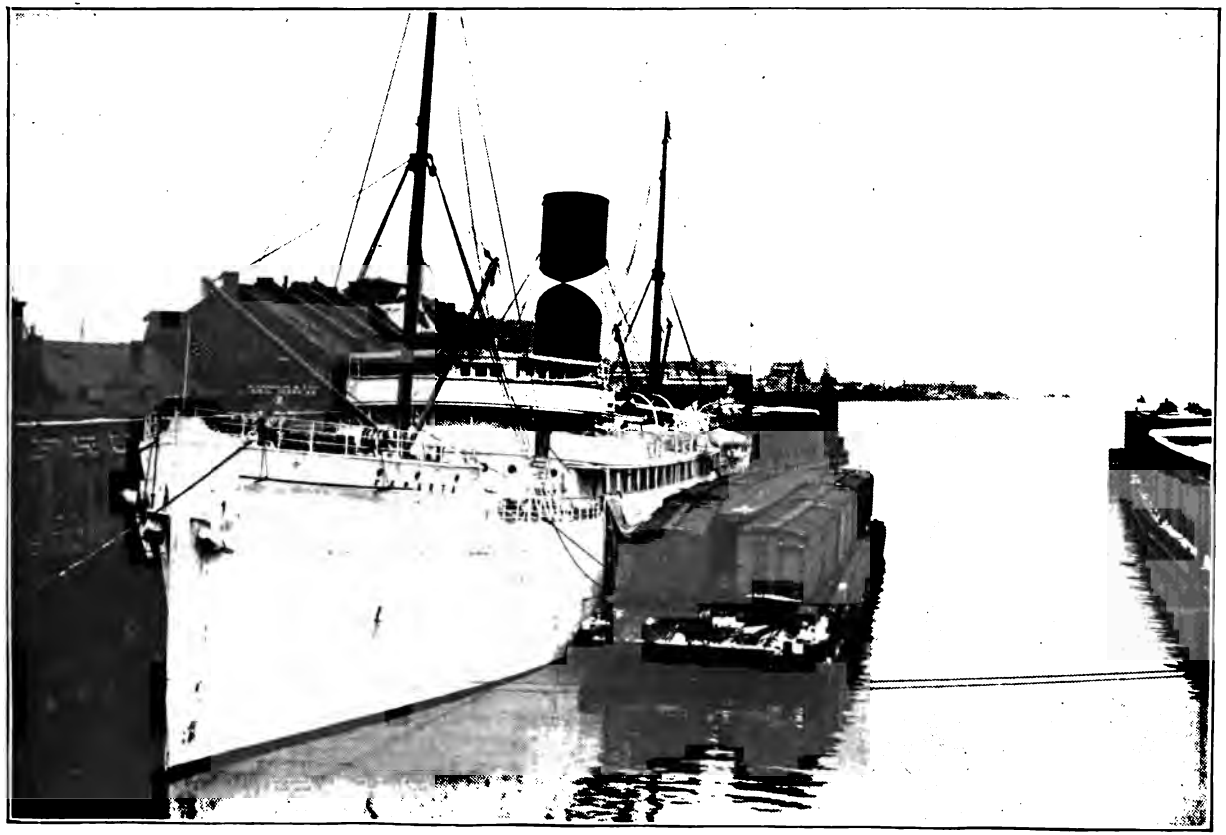
Steamship Companies employing Lighters or Car Floats.

The United Fruit Company.

According to statements made to the Commission's representative by a high official of the United Fruit Company,[1] the railroad freight service at Boston is extremely unsatisfactory. He asserted that, owing to the physical conditions of the wharf, his company is unable to have a spur track from the Union Freight road and must either dray or lighter fruit from the company's steamer to the various railroads. The wharf is too narrow to accommodate freight cars and at the same time afford room for team service.

The official in question stated that he can car float the freight of the company only to the New Haven, because the other roads

[1] This company's business was investigated because it is the principal user of the only railroad owned car floats at the port of Boston.



United Fruit Company's Use of Car Floats. Fruit being transferred to One of Boston's Two Railroad owned Car Floats.

lack the facilities. He stated that if the Boston & Maine had car floats he would car float about 3,600 cars a year to its docks. This has to be drayed at present, he said. This official says that his company is the only shipping concern in Boston which ships potatoes to the south and the West Indies, and that he has tried to get the New Haven people to let him use their car floats to the Boston & Maine docks as that road taps the potato country. They would not agree to this, and as a result he had to have potatoes drayed from the Boston & Maine terminal to his wharf. He said that two years ago when he tried to get the New Haven people to let him use these car floats, in connection with business to and from the Boston & Maine or the New Haven road, neither the New Haven nor the Boston & Maine officials then on the job appeared to know that one end of the New Haven car floats had been arranged to fit the Boston and Maine Mystic docks.

The charge for car floating freight from the United Fruit Company's steamers' side at their wharf to the New Haven docks, South Boston, is $6.50 per car. It is much more satisfactory to take his particular kind of goods right out of the ships into the cars or car floats than it is to load it on drays and then dray it away, the United Fruit Company official said. He also stated that some days he needs three car floats. One of these New Haven floats is required to make a second trip in order to take the freight which it has to go out over the New Haven. Through this second trip, two hours is lost in handling this kind of freight, he said. He has asked the New Haven people to bring around from New York one 12-car float and offered to pay the towage on such float around the Cape, but they declined to do this, he asserted.

It was stated by this official that if the United Fruit wants to have cars ready at the ship's side on Wednesday, the New Haven people have to know it Monday. Service in that respect is slow, he complained. He declared that loading fruit on drays from the steamer in cold weather spoils a lot of fruit, whereas if it was loaded on cars right at the ship's side the employees of the company could treat the cars themselves and save a great deal of fruit. This is true also to a large extent respecting potatoes, he said.

About 8,700 carloads of fruit are reshipped from Boston by this company every year; and of these, 1,488 are car floated to the New Haven, in about 186 floats of 8 cars each, and 7,212 car loads are drayed to the railroads, this official stated.

A vast difference in the switching rates of the trunk line companies was pointed out by this official. Sometimes, he said, it is necessary for business reasons to load a car at one of the railroad yards and then await a customer for this fruit. If he loads the car at the Boston & Albany yards and wishes to have it switched to the Boston & Maine tracks for shipment over the latter road, he can have the transfer made by paying a $8 interchange charge, $2 of which would go to the Boston & Albany and $6 to the Union Freight. If he loaded the car on the New Haven and shipped to the Boston & Maine or if he loaded it at the Boston & Maine and had to ship it to the New Haven or Boston & Albany, the same car shipped the same distance would cost him $10, he said.

He says that it takes about a day longer to get goods to their destination when such movement is made by railroads than through drayage directly from the wharf to the railroad.

Metropolitan Line.

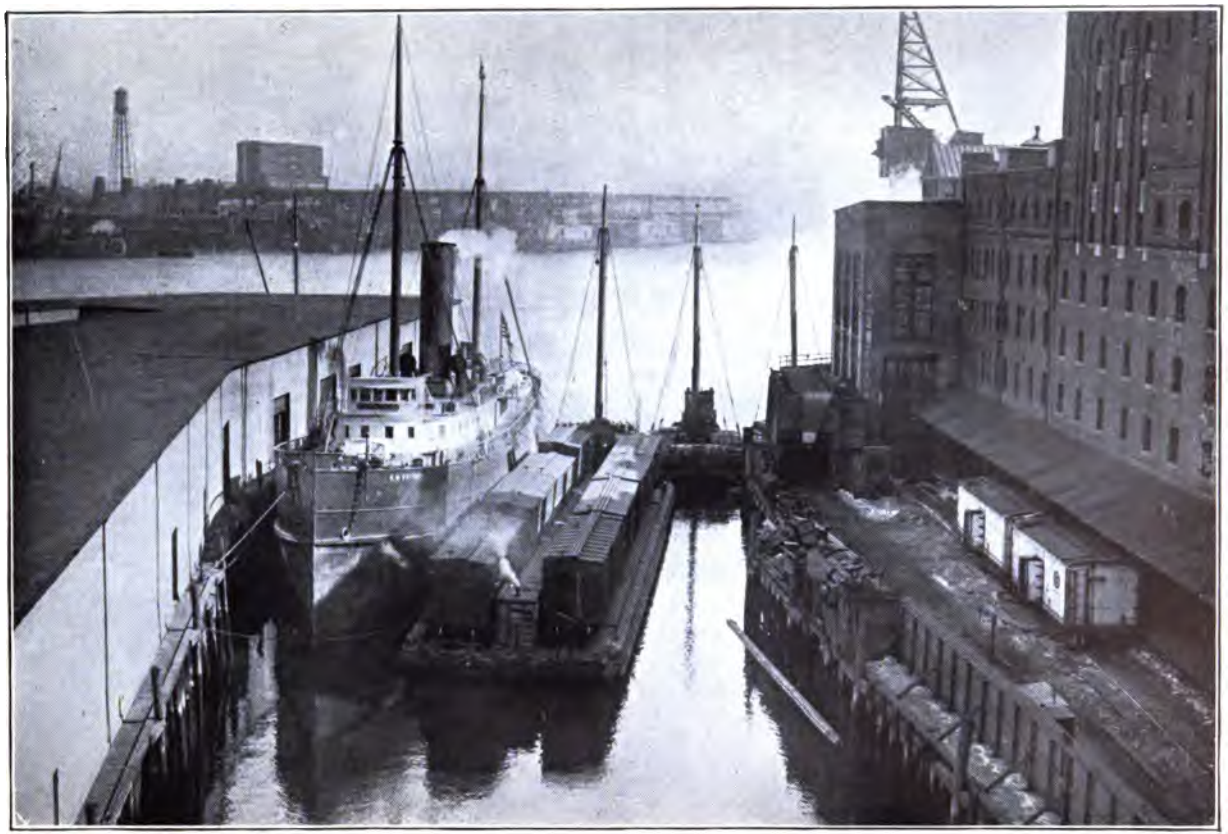
The Metropolitan Line conducts a New York service. Its Boston terminal is at Union Wharf.

This line owns and operates the only car floats used at the port of Boston aside from the two owned by the New York, New Haven & Hartford Railroad.

The bulk of the business which this company has with the railroads is done with the Boston & Maine. All of its carload shipments are either car floated or lightered to and from the Mystic docks of the Boston & Maine, and its less than carload shipments of less than 5,000 pounds are drayed to the railroad terminals. The company does not use car floats for what business it has with the New Haven or the Boston & Albany, but occasionally it lighters some of its freight to and from the docks of these roads.

The company's officials say that the Boston & Maine people discourage the shipment by lighter of less than 5,000 pounds. A flat rate for car floating and lighterage in excess of its rate to or from Boston of 3 cents per hundred pounds, with a minimum charge of $10 a car is charged by the company. This charge holds good anywhere in the harbor.

The company has through rates between New York and inland points via lighters, car floats and the Boston & Maine road. It does not have through rates with points along the Maine coast, as other boats of the company serve these points.



Metropolitan Line's Use of Car Floats and Lighters. Freight being transferred from One of the Two Steamship Company owned Car Floats in Boston.

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According to its officials, the Metropolitan Line is allowed 3 cents per hundred pounds in the through rate for lighterage or car float service. The Metropolitan Line officials say that they have a number of requests for the use of their lighters. They assert that they could have these lighters and car floats rented all the time if they cared to, but that they employ this equipment exclusively for the use of their company.

On less than carload freight, or any freight that is transported to or from the railroad terminals via teams, there is a flat teaming charge of 4 cents per hundred pounds. For shipments to or from any points in the business district there is a flat teaming charge of 5 cents per hundred pounds, always excepting extraordinarily heavy freight which requires extra labor to handle. In this case, the charge is more.

This company, its officials say, does a great Lynn business. They state that it does nearly all of the General Electric Company's business between Lynn and New York and via New York to other points. There is a through rate between Lynn and New York. The Lynn shipments are made via Boston & Maine to or from the Mystic docks; thence via lighter to or from the company's steamers. In each case the company is allowed 3 cents per hundred pounds out of the through rate for lighterage or car floating. The General Freight Agent of the company stated that the company car floats about 40 carloads a week to the Boston & Maine docks and about 32 carloads from these docks. The freight to the Mystic is largely cotton, and from there, miscellaneous. He was unable to estimate the quantity of freight lightered, but stated that about 25 per cent. of the company's freight is either lightered or car floated.

There was formerly a track connection between the wharf occupied by this company and the Union Freight Railroad. This also served a storage warehouse on an adjoining dock; and the cars shipped to and from this warehouse, the company's officials say, interfered considerably with the teaming business to and from the steamship company's wharf. Finally the company decided to sever the connection between the Union Freight tracks and the wharf itself.

The officials at the company's general freight office stated that they found that their company could do the transferring of freight by lighter cheaper than by the Union Freight. They charge the shipper three times as much as the Union Freight

rate for this distance. Officials of the company stated that they had no ready information as to the exact cost to them for the interchange by lighters and car floats.

Merchants and Miners Transportation Company.

The main Boston terminal of this company is located at Pier 2, Northern Avenue, South Boston, which is owned by the New Haven road and leased by the company. For some time the company has also been using its old location at Battery Wharf in conjunction with its new one at South Boston, owing to the pressure of the freight business. The South Boston terminal is connected by a spur track with the New Haven road, while the Battery Wharf terminal is connected with the Union Freight.

This company has 9 sailings a week to Baltimore and other southern ports.

The company maintains 8 covered lighters, 5 of which are heated. These hold from twelve to fifteen carloads each, and on account of their construction all goods are trucked in and out of them. These lighters are towed by the company's own tow boat.

A large portion of the company's business is lightered, though just what this really amounts to, the officials of the company say they could not tell without quite an extensive examination of their books. Most of the company's lighterage business is with the Boston & Maine docks. It transfers both C.L. and L.C.L. freight for a flat rate of 4 cents per 100 pounds.

The Boston & Maine freight lightered by the Merchants & Miners Transportation Company is that which is destined to or which comes from points west of the transfer points, such as Lawrence, Nashua, Salem and Springfield, the company's officials say. They assert that the freight to and from east of the transfer points is drayed to railroad terminals.

Some of the interchanging with the New Haven is done by freight being teamed to the New Haven sheds, while some of the freight is loaded on New Haven cars right at the docks, officials of the company say. They declare also that they do a very large local business.

The Clyde Line, Lewis Wharf.

The Clyde Line, the steamers of which sail between Boston, Charlestown and Jacksonville, charters five lighters from the Boston Towboat Company. These lighters are used to a very

large extent in the transferring of northbound freight from the company's wharf to the water terminals of the railroads and the wharves along the Boston water front. The lighters are towed by tugs of the towboat company which owns them. The company's officials say that the lighters are seldom used for southbound business.

Lumber is the principal freight carried by this company from the south, although it does a general freight business. There is a connection between the wharf of this company and the Union Freight.

The company's lighterage rate on most commodities is 4 cents per 100 pounds, but the rates vary from 2 cents a hundred on such freight as clay, rosin, pitch, tar, etc., up to 10 cents a hundred pounds on household goods, vehicles, etc.

The company, its officials say, will absorb the lighterage charges within the Boston "lighterage limits," that is, it will deliver freight that it brings up in ships from the south to any of the terminals of the railroads or wharves above one bridge for the flat Boston rate. For every bridge in addition, an extra charge of $2 is made.

The Ocean Steamship Company (Savannah Line).

The Ocean Steamship Company (Savannah Line) owns and operates two lighters in connection with its own shipments. The company's northbound freight, in connection with which lighters are used is chiefly lumber, although it also lighters cotton and other merchandise.

Bay State Street Railway Company.

The Bay State and the Boston & Worcester Street Railway companies both maintain a trolley freight service to and from Boston. The Boston terminals of both companies are located at Copps Hill Wharf at Commercial Street. Prior to December 1 last, the Bay State company was the Boston agent of the Boston & Worcester company, but since that time, the Boston & Worcester has handled its own freight in Boston. Both companies enter Boston over the rails of the Boston Elevated road. Both pay the Elevated road on a car basis and the Elevated road furnishes the car crews, current and terminal facilities. The Boston Elevated does not yet do a trolley freight business.

At the wharf in question there are four small freight houses, three of which are occupied by the Bay State company and one

by the Boston & Worcester. The Bay State company confines all of its freight operations to its territory to the south of Boston. This company operates freight trolley cars between its Boston terminal and Providence, and at Providence it connects through the Hartford & New York Steamship Company with New York.

The company operates 32 freight trolley cars of from 8 to 15 tons capacity, and its cars make about 23 round trips a day between Boston and Providence and serve the various cities and towns between Boston and Providence, giving them a fast freight service. Through a connection with the Brockton & Plymouth Street Railway Company, with which it has a joint freight tariff, it handles freight for various towns on the Cape and through to New Bedford. Through service and rates can be had over the rails of this company between Fall River, Plymouth and Boston.

The company started its service about ten years ago, and has been gradually increasing its freight business since then. The company's business is almost entirely package freight, though it, on rare occasions, handles carload lots. About 75 per cent. of the goods that it handles are perishable.

The company maintains freight stations in all of the cities and towns it serves, and its cars load and unload freight at these stations. As a general thing, the freight is teamed at the expense of the shipper or consignee to or from these stations. Until recently the company maintained delivery teams, but it has given this up.

At Providence the company has a system of sidewalk deliveries, while in Boston all of its freight is brought to and taken from its Copps Hill Wharf terminal in teams. The company has through rates from all points on its line to Boston except New York, and from New York to all points on its line as far as Neponset. Goods shipped from New York to Boston under the present system of the company must be billed first to Neponset and reshipped to the Boston Terminal. The rate between New York and Boston is the through rate from New York to Neponset plus the local rate from Neponset to Copps Hill Wharf. This, it was stated by the General Freight Agent of the company, is due to the fact that the company has never filed with the Interstate Commerce Commission a through tariff between New York and Boston. He says that the reason for this was that the company with its present equipment could not handle the New York-Boston business that it would get if a through tariff rate were published.

The company has no physical connection with the Union Freight nor with any of the railroads. All of its freight from and to the railroads in Boston is delivered from and to its Copps Hill Wharf terminal by teams. The company's officials complained that the steam railroads absorb the railroad switching charges and in some instances will absorb the Metropolitan District short haul charge on the freight west of Buffalo, but will not absorb the short hauls of the trolley road. For instance, according to the general freight agent of the Bay State company, the Boston & Albany on a shipment of shoes from Brockton to a point west of Buffalo will absorb the New Haven charges from Brockton to Boston, and the rate given to Brockton and Boston is the same. They say that a shipment of shoes via the Bay State company's freight trolley would cost the shipper the trolley freight charge from Brockton to Boston plus the teaming charge, from the trolley terminal to the railroad terminal, plus the regular through rate to point of destination.

The Bay State officials state that they make much faster time than the railroads; that their service is much more frequent; and that in the summer time the cars are kept well ventilated, whereas in the winter they are heated, and that the shippers get the advantage of the heated car in winter and a cool car in the summer without the additional charge made for that service on the steam roads.

The Bay State company, although its Boston freight terminal is located on the wharf on a splendid water-front property, does not use the harbor in connection with its business. The road does not use lighters or car floats.

Where the Bay State ships in conjunction with the steam roads, the charges are what is known as a "combination of locals." It loads and unloads freight without extra charge, and interchanges at Copps Hill Wharf and at Providence and with trolley line connections, without any interchange charge.

At Boston when it has a car containing freight for shipment over the Boston & Worcester tracks, the Bay State road runs this car into the Boston & Worcester company's terminal and there unloads freight for the Worcester company's points. Frequently this interchange is made from one car to another; that is, the Bay State company runs its car alongside of the Worcester company's car at the terminal and unloads freight from the former into the latter. The employees of both companies work together in an operation of this kind.

The company's officials stated that possibly a Union Freight Company spur track might eventually be a good thing from their standpoint. They could then load their freight for the railroads directly into freight cars, they said. This, however, they stated, is not necessary at this time, as they would not have a carload at any one time for any railroad. The amount of goods teamed from the Bay State terminal to the railroads is less than two team loads a day at present, they say. The freight sheds of the company are very small, and not more than eight or ten cars can be unloaded at the same time.

An illustration of the speed of the company's service was given by the General Freight Agent, who stated that the company starts a car out of Copps Hill Wharf at midnight every night and the freight in that car is ready for delivery at Providence at 6 o'clock in the morning.

Prior to making the present arrangement with the Boston Elevated road, the company entered Boston from Neponset by auto trucks. These were, however, too expensive to maintain, the officials of the company state.

Boston & Worcester Street Railway Company.

The Boston & Worcester road operates between Boston and Worcester. It has connections with Springfield and other parts of the State. It operates nine freight trolley cars and has six more under construction. The latter, the officials say, will be ready for service within a short time. The company's officials state that the cars are nearly all loaded to capacity all of the time and that they make nine round trips a day between Boston & Worcester. The cars have a capacity of twenty tons. The new cars will have a capacity of twenty-five tons.

The company quotes through rates only to Worcester, as it does a strictly intrastate business. Its tariffs are not filed with the Interstate Commerce Commission.

The company reaches Copps Hill Wharf over the Boston Elevated lines and has a similar arrangement to that of the Bay State company with the Boston Elevated road.

The company also maintains freight houses in the cities and towns which it serves, and like the Bay State, its freight is delivered at these stations and terminals, and unless interchanged with other street railway companies is drayed to and from its stations and terminals. This company as well as the Bay State company has authorized forwarders, who charge 4 cents per

hundred pounds for the delivery of freight to and from the various railroad stations.

The company does not use any lighters or car floats, nor does it use the harbor in any way. It has no physical connection with the Union Freight Railroad nor with any of the trunk lines.

The cars of this company are all heated in winter and the company is planning a refrigeration scheme for all cars in the summer time. The present plan is not to charge anything for that service.

It was stated by the Freight Agent that the company will deliver freight at its Worcester terminal two hours and thirty minutes after it leaves the Copps Hill Wharf terminal.

The General Freight Agent of this road said that there are great possibilities for the extension of this service by means of track connections with many of the larger wholesale houses. Connections of this nature would tend very largely to eliminate the congestion of traffic, he stated.

The officials of both the Boston & Worcester and Bay State companies stated that their rates are just about the same to all points as those of the railroads. (Owing to the limited time which it was given to make its investigations, the Commission was unable to make a comparison of the steam railroad and trolley freight rates.)

Proposed Improvements. — The Board of Port Directors contemplates the filling in of a large area of flats and the construction of a number of large piers to be connected by a marginal freight road.

Work has been started upon a monster new dry dock to be 1,200 feet long, 120 feet 3 inches wide at the entrance and 35 feet deep over the sill at mean low water. This work is being done under the direction of the Port Directors and the dock when completed will be the largest dry dock on the Atlantic coast.

Notes. — Boston is served by three big railroads, — the Boston & Maine, the New York, New Haven & Hartford and the Boston & Albany (leased by the New York Central). It is also served by the Boston, Revere Beach & Lynn, a narrow gauge road which runs between Boston and Lynn and which is maintained exclusively for passenger service. Its railroad terminal is in East Boston and it ferries its passengers across the harbor between East Boston and the mainland. Three trolley roads, the Boston Elevated, the Bay State and the Boston & Worcester companies, serve the city. The trolley business of the

city proper is done by the Boston Elevated road, the other roads entering the city over the Elevated company's tracks.

The port of Boston extends from Point Shirley on the north to Point Allerton on the south. It has 141 miles of water front, with over 40 miles of berthing space. Of the latter, over six miles has a depth of 30 feet at mean low water with 9½ feet more at high water.

The port has eleven rivers and tidal inlets branching from it. All of these are navigable, and some of them exceed in tonnage many ports. The Board of Port Directors, a State Commission with power to build docks, fill in flats, etc., has jurisdiction over the port.

In all there are 134 piers and wharves, also three marine railroads and three dry docks at the port of Boston. Of these the State owns 7; the city, 17; and the railroads, 22. Steamship companies and private persons own the rest.

There are available for large vessels in the foreign trade 24 piers. Of these the Commonwealth owns 2; the railroads, 13; and the steamship companies and private persons, 9.

Smaller vessels, largely those in coastwise commerce, can use 74 of the wharves and piers. Of the latter, 2 are owned by the Boston & Albany Railroad and are known as the Grand Junction wharves, East Boston. Shipbuilders and repairers of vessels, other than yachts, use 15 wharves and piers, while 21 wharves and piers are used for public recreation purposes and landings for yachts.

The two State piers are located in South Boston. One is the Commonwealth Pier, which is 1,200 feet long and 400 feet wide with a depth of 40 feet at mean low water alongside. This is used by trans-Atlantic steamers. The other State wharf, which adjoins the Commonwealth Pier, is known as the Fish Pier. This is 1,200 feet long and 300 feet wide with a depth alongside of 23 feet at mean low water. It is leased to the Boston Fish Market Corporation.

At the Boston & Albany Railroad terminal in East Boston there are six piers, the longest of which is 781 feet long and 240 feet wide. All but one of these piers are owned by the railroad company. The sixth pier is owned by the State but is not in operation. There is a general depth of 35 feet alongside these piers at mean low water. The Boston & Maine Railroad has 11 piers in Charlestown, 5 of which are known as the Hoosac Tunnel docks and the rest as the Mystic docks. The longest of

these is 2,400 feet. The depth alongside most of these piers is 30 feet at mean low water. At the longest pier, however, the depth is but 20 feet at mean low water.

The New York, New Haven & Hartford Railroad at South Boston has three piers and a car-float landing stage.

There are three grain elevators on the water front that serve ocean-going steamers. These are located at the Hoosac terminal of the Boston & Maine at Charlestown, the Mystic terminal of the Boston & Maine also at Charlestown and the Boston & Albany Railroad terminal at East Boston. The capacities of these elevators are as follows: the Boston & Albany elevator at East Boston, 1,017,190 bushels; Boston & Maine elevator at Hoosac terminal, Charlestown, 1,000,000 bushels; Boston & Maine elvator at Mystic terminal, Charlestown, 500,000 bushels. There are also three floating grain elevators, each about 30,000 bushels capacity; two of these are owned by the State and one by the Boston Towboat Company.

The Commonwealth owns 1,227.51 acres of lands, flats and docks, all of which are under the control of the Directors of the Port. Of this, 435 acres are in South Boston; 658.99 acres are in East Boston; 10.70 acres are the site of Pier 1, East Boston; and 122.82 acres are the area of the Bird Island Flats. The assessor's valuation of the Commonwealth's lands exceeds $9,000,000.

The Commonwealth originally owned more than 100 more acres of lands and flats in South Boston, but these have been sold from time to time to the railroad companies. In all there is a water frontage of about 17,000 feet of the Commonwealth's lands undeveloped. In addition there are large areas of flats in South and East Boston which are in process of development.

Boston is nearer the ocean than any other big port on the Atlantic coast, in either the United States or Canada. It is 190 miles nearer Europe than any other large city in the United States.

It is further from Chicago, however, than Philadelphia by 164 miles, and further from Chicago than Baltimore by 188 miles. On export and import Philadelphia has a cheaper rate than Boston from Chicago by 2 cents per hundred pounds, and Baltimore has a cheaper rate from Chicago than Boston by 3 cents per hundred pounds.

About 80 per cent. of the export freight is affected by these differentials, and about 20 per cent. of the import freight. New York and Boston have the same rate to and from the west.

Akron, O.

Population, 1910, 69,067.

Belt Line. — Yes.

The belt line railroad connects with five different railroads of the city. It is 23.4 miles long, and is owned jointly by the Pennsylvania Railroad, Baltimore & Ohio, and Erie Railroad.

Other Methods of Interchange. — The Pennsylvania, Baltimore & Ohio, Erie, Northern Ohio, and Akron, Canton & Youngstown railroads have interchange tracks within the city and daily interchanges are made. There is an average interchange of about 230 to 240 cars per day. It takes on the average five or six hours to make this interchange.

Interchange Charge. — The belt line charges for interchange service $2, $3 and $5 per car, depending on mileage.

The trunk lines charge $2.50 per car, and this is absorbed by the road enjoying the road haul.

Proposed Improvements. — None.

Notes. — The belt line interchanges approximately 9,000 cars monthly. It is claimed by the officials of the road that the belt railway has fostered the industrial growth of the city, helping to increase the business of existing factories, perhaps, more than to attract new industries.

Akron has been growing at a very rapid rate, Chamber of Commerce officials say. They state also that their Chamber has urged the railroads from time to time to increase the length of their interchange tracks so as to provide more adequate interchange facilities. A number of improvements have been made, but at the present time considerably more are needed.

Albany, N. Y.

Population, 1910, 100,253.

Belt Line. — No.

Other Methods of Interchange. — Freight brought into the city is interchanged between lines of different railroads by the Trunk lines themselves. No data are available on number of cars interchanged or handled by companies. Railroads are in direct physical connection with wharves. The terminals are in the center of the city or opposite the center of the business section of the city, thus bringing about a great saving in drayage charges.

Interchange Charge. — Absorbed by company enjoying road haul.

Proposed Improvements. — The city has adopted a plan for development of water front and terminal facilities proposed by committee of the Albany Chamber of Commerce. The project has been under process of construction for about two years and is rapidly nearing completion. It includes construction of large freight yards by the New York Central, the increasing of the number of tracks in the present passenger terminal from 7 to 21, and the enlarging of the New York Central bridge to carry 4 tracks in place of 2 at present in use.

City is making a fight for 27-foot channel in Hudson River from Hudson to Albany. Officials say that if this fight is won, the city will develop a large terminal south of the city where it owns 175 acres with a frontage of a mile on the river. It is proposed to construct at this point a series of 1,000-foot slips with direct rail connections.

Note. — Chamber of Commerce through secretary states that business men and railroad people regard system of freight handling as perfectly satisfactory.

Atlanta, Ga.

Population, 1910, 154,839.

Belt Line. — No.

Other Methods of Interchange. — Each railroad has its own classification yards, freight houses, and delivery yards, with the exception of the Atlanta & West Point, Georgia Railroad, and Louisville & Nashville. These roads operate what is known as Atlanta Joint Terminal; freight handled to and from Atlanta by these lines is handled through the agency of this terminal. These lines are closely allied in matter of ownership and management.

All Atlanta lines with the exception of the Louisville & Nashville interchange carload freight for placement at industrial or assigned sidings under reciprocal switching arrangement. Interchange is performed twice daily, morning and afternoon.

Interchange Charge. — Switching charges of delivery lines are absorbed by the transportation lines on competitive business. On local shipments — those originating at strictly local points on the originating or delivering lines — switching charge is paid by the shipper or consignee, the amount being in addition to the usual freight rate.

Proposed Improvements. — None.

Baltimore, Md.

Population, 1910, 558,485.

Belt Line. — Yes.

A municipally owned belt line is now operated for about 1¼ miles over the marginal street known as the Key Highway. This road, which connects with a number of industries, is operated by the Baltimore & Ohio road and at present connects only with this road. The belt, however, is being built to connect with all railroads entering the city and will be, when completed, about 3½ miles long. City Engineer McCay says that this road has already done much to develop the section of the city which has remained industrially stagnant for fifty years. City officials say that they build much of their hope for the development of their city about the Key Highway, the marginal street over which the belt road is operated, and the belt road itself.

Other Methods of Interchange. — There are three points of interchange between the various railroads. The Pennsylvania Railroad and Baltimore & Ohio interchange at Bayview Junction, three miles beyond the city limits. The Maryland & Pennsylvania Railroad interchanges with both the Pennsylvania Railroad and the Baltimore & Ohio at North Avenue and at Oak Street which are within the city, and the Northern Maryland interchanges with the Pennsylvania Railroad at Fulton Junction, also within the city. The only means of interchange between the Baltimore & Ohio and the Western Maryland is through the Pennsylvania Railroad at Fulton Junction.

Interchange Charge. — The shipper or consignee pays for the interchange service. The system of interchange charges is complicated and has long been the subject of agitation, shippers being actively engaged in the fight to secure flat Baltimore rate to all points in Baltimore, regardless of switching necessary. Upon interstate traffic the roads assess what they term joint class rates for interchange in addition to the regular Baltimore rate on a single line.

There is one notable exception in Baltimore as far as rates go. This is the Canton Company, a private corporation, which has developed a tract of 1,500 acres on the outskirts of the city along the water front. This company gets a flat Baltimore rate for its industries.

Proposed Improvements. — In addition to the extension of the belt line, the city is extending its marginal street along the

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water front to about 3½ miles in length. This road is 106 feet wide. The taking over of the terminal facilities of Baltimore by the city has been suggested by many, and with this in view plans have been sent to the City Planning Board. This would involve the construction of new tunnels, new Union Station and the expenditure of $17,369,000.

Notes. — Baltimore is 150 miles from the ocean. It is served by 3 big trunk railroads, — the Baltimore & Ohio, Pennsylvania Railroad, and Western Maryland; also by Maryland Electric Railway Company, a former steam road which runs from Baltimore to Annapolis and does a passenger and express business. The Maryland and Pennsylvania Railroad Company, with a trackage of 76 miles, does a passenger, freight and express business between Baltimore and York County, Pa.

The city of Baltimore owns large tracts of water-front land along the belt line and seeks to attract business industries there. Officials say that the city plans to sell land to industries, or if the heads of such industries prefer, the city will build plants and rent or sell them. Baltimore Harbor is administered by a Board of five members, of which the Harbor Engineer is President. There are nearly six miles of municipal wharfage front and thirty-two miles of private wharfage front within the city limits. Ten miles of this is occupied by railroad piers and docks. The city has expended for public wharves and docks about $8,000,000. It has also expended $750,000 on the Key Highway and is to spend $1,250,000 on this highway and another marginal street. The city has eleven piers with a total acreage of 1,257,036 square feet. Some of these are leased and some are open, as the occasion requires.

The Baltimore & Ohio has a passenger station at Mount Royal and another, Camden, in the business section. These are connected by a tunnel known as the Baltimore Belt Line, through which through trains pass under the city. The road operates electric engines through this tunnel. The Baltimore & Ohio has a big marginal terminal where exports and imports are handled, as well as the freight which goes by steamers between Chesapeake Bay points. At this terminal the Baltimore & Ohio has twelve large piers and two great grain elevators with a capacity of 2,500,000 bushels. Total capacity of train yards is 3,988 cars. Near the Camden passenger station the road maintains Camden warehouses for the reception of package freight, while the produce freight is handled at Sharp Street. One of the

largest and best equipped coal piers in the country is maintained by the Baltimore & Ohio on Curtis Bay. This pier is 800 feet long. The Pennsylvania Railroad's main passenger station is the Union Station, a fine modern structure. It also maintains the Calvert Station in the middle of the city, the Biddle Street Station in the east section, and the Pennsylvania Avenue Station in the northwest section. This road also uses railroad tunnels and uses its own locomotives in connection with them.

The Western Maryland's main passenger station is Hillen. It also operates from Union Station and has another station at Walbrook. This company has a big freight terminal at Fort Covington on the outskirts of the city, where it has 3 piers. One, a coal pier, is 1,295 feet long; another, a covered pier, 836 feet long by 120 feet wide; thie third, an open pier, 830 feet long by 60 feet wide. It maintains pontoon bridges for transferring of cars. At Fort Covington it has storage capacity for 2,000 freight cars.

The Baltimore & Ohio has an extensive lighterage and car float service. All the railroads have their own lighters and car floats and use the same between their own terminals and water front industries. Railroads, however, do not use these lighters or car floats for interchange purposes. Traffic paying 7 cents per hundred pounds or more is lightered within lighterage limits without cost to shipper or consignee. This is applicable on carloads with a weight of 12,000 pounds.

The Canton Company, a corporation of many years' standing, has 1,500 acres, all land made from dredgings of the river. It sells factory sites or builds and lets factories, as heads of industries may prefer. It owns and operates large warehouses and docks. The company's property is connected by its own rails with other railroad companies entering Baltimore. It maintains its own locomotives, and charges its industries 10 cents a ton for interchange switching to and from wharves and piers of the Canton Company. With wharfage this charge amounts to about 35 cents a ton. Officials of the company say that the total value of industrial plants on property is approximately $100,000,000.

Birmingham, Ala.

Population, 1910, 132,685.

Belt Line. — Yes

There is a belt railroad which connects all lines and performs impartial service and affords industrial accommodations superior to any one line in the Birmingham district, according to the President of the Board of Trade. This railroad is owned by the Frisco system and is operated separately and independently.

Other Methods of Interchange. — There are ten railroads entering Birmingham, all of which do some of their own interchanging. Three lines — the Illinois Central, the Frisco and the Central of Georgia — have a terminal arrangement for the joint handling of freight in a joint yard. The Illinois Central and the Central of Georgia have joint freight houses, while the Frisco has its own house, as do all of the other lines that enter the city. The railroad yards in most instances are somewhat removed from the team and house facilities. Less-than-carload freight handled at freight houses for forwarding by other lines is loaded into trap cars or handled by public drays direct to freight houses. Cars are interchanged between lines the same day they are received and there is no delay, according to letter of the Board of Trade of Birmingham.

Interchange Charge. — Carload freight is interchanged on a per diem basis. Where direct connection is made between lines, no charge is made by either carrier for handling.

Proposed Improvements. — None.

Note. — According to the President of the Board of Trade, there is no complaint respecting the handling of freight by the railroads. Railroads seem alive to the necessity of supplying adequate facilities and perform first-class service. For this reason there have been no suggestions of a change.

Buffalo, N. Y.

Population, 1910, 423,715.

Belt Line. — Yes, two.

There are two short terminal railroads which provide the service of an independent belt line within their territory. These are the Buffalo Creek Railroad, which is 6.65 miles in length with a total trackage of 26.10 miles, and the South Buffalo Railroad, 5.91 miles in length with a total trackage of 36.17 miles.

The first of these is owned jointly by the Lehigh Valley and the Erie. Its charter provides fixed switching rates on a reasonable basis and makes discrimination in rates impossible, so that all shippers on connecting railroads enjoy equal charges for the same or equal service. The second belt is primarily an industrial railroad owned by the Lackawanna Steel Company and serves its plant, but in addition also serves a large and growing industrial district. Like the Buffalo Creek Railroad, it is necessarily operated as an open or independent terminal and all shippers on connecting railroads fare alike. These two short railroads are the only open terminals in the Buffalo District at the present time.

A proposed independent outer belt line to connect all of the railroads which enter Buffalo is advocated by George H. Kimball, Chief Engineer of the Terminal Station Commission at Buffalo.

There are three lines making connection at International Bridge which are commonly referred to as belt lines, but there are really interchange connections between the outer yards and the International Bridge for the use of the railroads that own them.

Other Methods of Interchange. — All the other railroads in Buffalo not mentioned above do most of their own interchanging and maintain terminal yards. The trips of all freight trains originate or terminate at the outer yards of the respective railroads, where, in general, the cars in trains are distributed and reclassified into (*a*) city and industrial freight; (*b*) lake freight; (*c*) interchange freight.

Certain classes of traffic such as coal for lake shipment, and live stock, perishable, or time freight for interchange, are handled wholly or in part in solid trains that do not require further classification.

City freight is grouped in cuts of cars for switching, in the outer yards of the respective railroads, and is switched direct to local freight houses or team tracks, or to "holding tracks" as near the points of final delivery as possible, to be again moved and placed as fast as track room for final delivery is available.

Lake freight is generally switched direct from the outer yards to the lake freight houses, coal pockets or docks for loading vessels.

Interchange freight, after car inspection, is delivered in switching cuts by the receiving to the forwarding railroad, in

the yard of the latter, or at some intermediate point mutually agreed upon, where tracks have been provided or designated for interchange purposes.

The handling of outbound freight is substantially the reverse of the processes described, although varied somewhat in detail. For lake freight outbound by rail, particularly grain, storage tracks for empty cars are provided as near the docks and elevators as practicable, in order to avoid delay, and to make solid trains of kinds, shipments or cargoes.

On business originating locally on one railroad and routed for forwarding via, or delivery on another line, switching charge is made by the road originating the freight, or making final delivery, and is absorbed wholly or in part by the line getting the benefit of the long haul. Switching rates, however, are largely prohibitive, and between this obstacle and the danger of delay to such shipments, each railroad is able to largely control the traffic originating locally on its line.

It is estimated that the daily traffic in and out of the Buffalo terminal district exceeds 20,000 cars, and the percentage of loaded cars is greater than 70 per cent. By agreement between the railroads, the maximum time fixed for making interchange deliveries is four hours. The average time is considerably less than the maximum.

Interchange Charge. — The average charge of the Buffalo Creek road is $2.10 per mile, the trunk line getting the benefit of the long haul absorbing the charge.

Proposed Improvements. — The Delaware, Lackawanna & Western Railroad Company is now constructing a new passenger terminal fronting on Main Street and the Buffalo River. This will require another year for completion. The Lehigh Valley Railroad Company is building a new passenger terminal fronting on Main Street. In connection with this improvement it has built a new local freight terminal, well located, which is expected to be the best in the city. A new passenger terminal for the New York Central and tenant lines which will have the characteristics of a union terminal is in prospect, but plans have not yet taken definite form.

Extensive up-river improvements of the river channel have recently been completed and industrial developments that require both rail and water transportation are following rapidly.

The problem of proposed improvements was taken up some years ago by the Buffalo Freight Terminal Committee, or-

ganized for the purpose, and composed of the transportation officials of the lines of railroad centering at Buffalo. Its work was concluded in May, 1904. Its plans briefly stated required unification of all railroads, the construction of a very large clearing yard capable of handling all of the freight traffic in and out of the Buffalo terminal district, and the operation of all these facilities in the joint interest of the railroads under one management. No tangible results followed this effort, but the idea of unification struck in and has been slowly growing and coming to the surface.

Notes. — What is known as the "Buffalo Terminal District" comprises not only the city of Buffalo, but an area, roughly triangular of nearly sixty square miles, extending from beyond the city limits at Black Rock on the north, to Blasdell on the south and Depew on the east. There are sixteen railroads converging on Buffalo, eleven of which reach the heart of the terminal district, have their own terminals, and provide facilities for other lines less favorably situated. In addition to these sixteen, there is the Buffalo & Susquehanna Railroad, which is a comparatively unimportant line. The railroads are divided into three well-defined groups of five each, converging on the three points of the triangular area above referred to. The exception is one of the Pennsylvania Railroad lines which comes in from the south and east about midway between Blasdell and Depew. The five lines of railroad composing the Black Rock group, so far as freight movements are concerned, terminate at Bridgeburg at the west or Canadian end of the International Bridge, where all of their terminal yards are located, and the interchange of freight is all made as a switching movement between Bridgeburg and Black Rock over the International Bridge, — a single track structure controlled by the Grand Trunk Railway.

The Delaware, Lackawanna & Western Railroad, the New York Central Railroad and the Erie Railroad own separate lines connecting Black Rock with their outer yards at East Buffalo. These connecting lines are independently operated, except that the Pennsylvania Railroad has temporary trackage rights over one of them. Primarily they are designed and used to control as much of the interchange traffic via the International Bridge in the interest of the respective railroads as is possible, but they are obliged to perform a switching service for connecting lines.

The three railroads first named have quite extensive yards at Black Rock. The switching engines of these three railroads and

of the Pennsylvania Railroad receive and deliver freight in the yards of the five connecting railroads at Bridgeburg; so that two separate switching movements are necessary to accomplish the transfer between Bridgeburg and East Buffalo.

In and about Black Rock there is an extensive and well defined industrial district, separate from the rest of the Buffalo terminals, that is served by the railroads above named. The New York Central has a line from Blasdell to Depew designed to divert freight traffic to and from the Lake Shore & Michigan Southern Railway, around the congested district, but for years it has been used only to a very limited extent. An extensive gravity yard, known as the Gardenville Yard, has been in process of construction on this line for some years. It is now incomplete, and statements have been made that it never will be completed, because of railroad consolidations.

At the present time there is no continuous movement of freight through Buffalo. Buffalo is a general breaking-up point, — a point of common interchange. It is a positive terminal for all trains, the cars of which are distributed, reclassified and made into trains again before forwarding. All lake and canal freight must break bulk and go through a similar process, and these conditions, together with the movement of city and industrial freight, involve a continuous process of switching and transfer.

Officials of the Buffalo Creek Railroad said that the road has done much to develop the district it serves and that this territory is now practically fully developed. Since the construction of the road, approximately 40 industries have settled on the route.

Chattanooga, Tenn.

Population, 1910, 44,604.

Belt Line. — Yes.

Owned and operated by the Alabama Great Southern Railroad. It practically encircles the city. Nearly all the industries at Chattanooga are located either on the belt railway or the Nashville, Chattanooga & St. Louis.

Other Methods of Interchange. — The trunk lines do most of the interchange business between each other, the belt serving industries chiefly.

Interchange Charge. — The arrangement of the trunk line service is as follows: —

The Belt Line has two blanket rates on business interchanged

with connections at Chattanooga; namely, $2.50 per car when paid either by the shipper or consignee and $3 per car when paid or absorbed in the rate to Chattanooga proper by the railroads, as they do on all competitive carload business and also on L.C.L. business, observing a minimum tonnage of 5,000 pounds. The Belt Railway also has a scale of local rates between the different industries and stations, which runs from $2 to $6.50 per car, depending on the distance. All the local rates are paid in advance, prior to the movement of the car, by either the shipper or consignee.

On inbound carload traffic destined to industries located on either the Nashville, Chattanooga & St. Louis or belt line railway the switching charge is absorbed, provided cars originate at competitive points. If originating at a non-competitive point, switching charge is in addition to rate, excepting Alabama Great Southern Railroad and the Southern railway will absorb switching upon both carload and less than carload traffic destined to industries on the belt railway originating at either competitive or non-competitive points. This applies also on shipments originating at Chattanooga and destined to competitive or non-competitive points. Freight moving into Chattanooga destined to other points in carload lots is interchanged without any expense, while less than carload freight is handled through the warehouse. The latter is concentrated and loaded into a car which is delivered to connections also free of charge.

Proposed Improvements. — None.

Notes. — The belt railway handles about 75 per cent. of the tonnage that is shipped to and from the industries in carload lots in the district of Chattanooga. According to a letter of the General Agent of two of the roads, this percentage is increasing, although figures are not available as to the rate. It was stated by the railroad people that there are 116 industries located exclusively on the belt, which have been built since the construction of the line, and that there are a number of other industries which are served jointly by the belt and other carriers. The railroad people state that many of these 116 industries could not have located in this district without the trackage facilities afforded by the belt railroad for the reason that the best sites on other lines are occupied.

The belt railway has 26 miles of line and 28 miles of sidings and industrial tracks.

Manufacturers' Association says that business men are very well satisfied with present terminal facilities.

Chicago, Ill.

Population, 1910, 2,185,283.

Belt Line. — Yes, five.

These are the Chicago Junction Railroad, Baltimore & Ohio, Chicago Terminal Company, Belt Line Railway of Chicago, Indiana Harbor Belt, and the Elgin, Joliet & Eastern Railroad. The three latter have junction points with all of the trunk lines entering Chicago. In all there are 43 belt line connections in the city. The terminal companies are all privately owned, most of them by other railroad companies. The Belt Line Railway is the principal agency for the transferring of carload freight business between the railroads of Chicago. It maintains a $10,000,000 clearing yard in the outskirts of the city. This stretches out about 5 miles, has 150 miles of tracking, and is built to provide for the interchanging of 10,000 cars a day.

Other Methods of Interchange. — Chicago has a number of universal freight distributing stations where freight to and from the city is sorted out and delivered in carloads to the railroad companies. Much of this work is done by the Chicago Junction Railroad. This interchange is without cost to the shipper.

Interchange Charge. — The switching charge of the Belt Line Railway for handling between railroads is $3 per loaded and $1.50 per empty car, except that on business originating at and destined to points within the Chicago District, the rate is based on a charge of one-half cent per hundred, minimum 60,000 pounds.

On through business, namely, shipments originating at and destined to points beyond Chicago, or shipments originating beyond and destined to points within the city, or originating at points within the switching district and destined to points beyond, the railroads generally pay the switching charge. Practically the only exception to this rule is on inbound grain in connection with five roads. On shipments originating at and destined to points within the switching district, the shippper invariably pays the switching charge.

On L.C.L. freight handled to and from freight distributing stations, the interchange is without cost to the shipper, the railroad which enjoys the road haul absorbing the charges, which amount to $1 per ton.

Proposed Improvements. — A new union station is being constructed. There is a general plan for the rearrangement of railroad tracks, construction of viaducts, etc., to permit the extension of the growth of the city along normal lines in the city.

Notes. — Chicago is the greatest railroad center in the world. It has 27 trunk lines, and, as stated above, 43 belt line connections. In all between 10,000 and 12,000 cars a day arrive in Chicago, about 50 per cent. of which is to be shipped through to other points.

Chicago has the only freight tunnel in the United States. This tunnel is owned and operated by the Chicago Tunnel Company and Chicago Warehouse and Terminal Company, which for all practical purposes are one and the same company, one company merely holding the franchise to build and operate the tunnels and the other to operate the terminals. Both companies are owned by the same stockholders. The companies jointly operate a freight tunnel under the streets of Chicago, 61 miles long, 7½ feet high and 6 feet wide. The tunnel has been in operation since 1907 and does an L.C.L. freight interchange business, hauls coal and ashes to and from big business concerns, and serves as the carrier in connection with the work of excavating for buildings. It operates four public receiving stations for the receipt and delivery of package freight to and from teams and freight cars. Through the tunnel, about 40 feet beneath the surface of the street, are operated trains of small cars over narrow gauge tracks. Between 600 and 800 of these carloads are handled through it every day. Strings of 7 to 10 cars are run in a train. Spur tracks of the tunnel railway run into the basements of big business houses and there are loaded and unloaded. This tunnel has 26 commercial connections and as many with railroads. The freight is brought to and from the street level of receiving stations by elevators. Electricity purchased from the Edison Company is used for motive power and lighting.

The charges for handling freight are absorbed by the railroad companies. They amount to about 6 cents per hundred pounds upon freight from public receiving stations and 4 cents per hundred pounds on freight from private connections. The tunnel cost $30 per linear foot to construct, and with terminals and equipment represents an investment of $40,000,000.

Thus far the tunnel has been a great disappointment to its promoters and has never been a paying proposition. It has been

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in the hands of receivers. Under the terms of the franchise, the tunnel reverts to the city in 1929, the city not to pay anything for it. This is merely, however, the tunnel and not the terminals. Officials of the tunnel company assert that three times the present business can be done by the tunnel and that the belt railroads compete strongly with them for business. Tunnel company officials say that there is a feeling among many shippers that the tunnel makes slow deliveries. They claim that this is not true and that the deliveries compare very favorably with those of the belt railroads. Officials also say that another deterrent has been the expense of putting in a private siding. They say that the ordinary siding, not at all elaborate, would cost about $25,000. This expense the company bore at first. Now the shippers must bear it.

Cincinnati, O.

Population, 1910, 363,591.

Belt Line. — No.

Officials of Cincinnati have in contemplation the construction of a belt railroad.

Other Methods of Interchange. — Each of the railroads has its own interchange facilities, and delivers and takes away cars it is interested in.

Interchange Charge. — Under an agreement between the railroads, the line performing the switching service in each case assumes the cost.

Proposed Improvements. — At the present time the officials of Cincinnati are considering the following improvements: (1) the construction of a rapid transit loop in connection with the operation of interurban electric cars; (2) elimination of the old canal within the city limits; (3) the construction of a new double-track steam railroad across the Ohio River by the trustees of the Cincinnati Southern Railway, the road which is owned by the city of Cincinnati and leased to the C. N. O. & T. P. Railway; (4) construction of a new passenger terminal for steam railroads and the relocation of some of the railroad tracks to avoid high water from the Ohio River.

Notes. — City ordinances prevent the railroads from using some of the interchange tracks by daylight, but, according to officials of the Cincinnati Chamber of Commerce, the interchange is made promptly at night, so that cars arriving during the day

are put on the interchange tracks at night and go out during the night or early morning.

In view of the prospect of a much heavier business through Cincinnati, by reason of the development of the coal mines in Kentucky and other reasons, these officials say there is some apprehension that freight will not move as promptly as heretofore, and for this reason the public is favoring various improvements outlined above.

Cleveland, O.

Population, 1910, 560,663.

Belt Line. — Yes.

A belt line is operated around the city as a physical connection with all railroads entering Cleveland except three. It is owned and operated by the New York Central lines west.

Other Methods of Interchange. — The system of interchange of freight varies according to the amount of freight to be transferred from one railroad to another. If quantity is great, traffic is trap-carred; if traffic is light, it is drayed. If there is no direct connection between railroads involved, an intermediate or belt line is used, the expense of which is paid by both lines.

Interchange Charge. — Interchange service expense is prorated by the initial and delivery carriers.

Proposed Improvements. — A new union passenger station is contemplated for Cleveland; pending settlement of passenger terminal question, improvement in the freight terminal facilities has been postponed.

Other terminal problems also under consideration are: Universal package freight station to which all lines will deliver package freight, and the other a proposed underground freight terminal, through which it is expected freight will be delivered from rail lines direct to warehouses. Franchises have been given by city council for both projects. Both plans were submitted for referendum vote last fall, and both were approved.

Columbus, O.

Population, 1910, 181,511.

Belt Line. — No.

Other Methods of Interchange. — The railroads do their own interchanging under reciprocal switching arrangements. L.C.L. freight with one or two exceptions is drayed between stations by transfer companies.

Interchange Charge. — Carloads switched between industries on the same road are charged for at the rate of 20 cents per ton with a minimum of 25 net tons; and between industries on different lines at 30 cents per ton, with a minimum of 25 net tons. On carload freight to and from connecting lines, for road haul, the switching charge ranges from $1.50 to $5 per car, depending upon service performed, distance of haul, etc. The charge is absorbed by carriers when the revenue is $10 or more. There are few exceptions to this rule. On L.C.L. freight drayed between stations by transfer companies, the charge is 3 cents per hundred pounds, which is paid for by the road making the delivery. All such freight arriving at freight houses before noon is transferred and moved out over connecting lines the same day. Approximately 500 loaded cars are handled daily.

Dallas, Tex.

Population, 1910, 92,104.

Belt Line. — No.

Other Methods of Interchange. — The various railroads perform their own interchange service and make charges for the same under rates for switching prescribed by the Railroad Commission of Texas.

Interchange Charge. — The switching charges range from $1 to $2.50 per car, depending on the distance hauled.

Proposed Improvements. — Extensive improvements of the terminal facilities are being made and other improvements are contemplated. The Freight Bureau of the Chamber of Commerce and Manufacturers' Association states that the switching service and other railroad facilities have been considered inadequate and very unsatisfactory, and a few years ago the citizens of Dallas took up the question of their improvement.

Mr. George E. Kessler, landscape architect of St. Louis and Kansas City, was employed to survey the city and present a plan for the general improvement, and Mr. John F. Wallace, Chairman of the Chicago Railway Terminal Commission, was retained to make a study of the terminal facilities of the city and to submit suggestions for improvements in the same. Both experts have submitted their reports; the Wallace report, having been presented but a short time ago, is not yet printed. The Kessler report was submitted in 1911, and since this report the railroad companies, the head of the Freight Traffic Bureau of the

Chamber of Commerce states, have been very active in developing the terminal facilities. There is now in course of construction a new union depot, which it is expected will be ready for use in April of this year.

Both Messrs. Kessler and Wallace recommended the construction of a belt railroad. Mr. Kessler recommended the construction of a belt line in two routes, one around Dallas and the other around Oak Cliff, to be connected with each other. He also suggested the construction of a union station on this belt railroad and the building of a freight terminal for local business, these to be part of the general plan to develop and beautify the city. In the Kessler report it was stated that, by means of the belt line suggested, all of the railroads now entering Dallas and those that might enter in the future could be connected and have perfect intercommunication. The report stated that "this belt railroad will be the means of drawing industrial and warehouse properties to its tracks."

Mr. Wallace in his report said: —

The construction of a belt line with adequate interchange and terminal facilities for the joint use of the railroads at Dallas would eliminate the necessity for general track elevation and would cost — including the double tracking and grade separation of a portion of the Missouri, Kansas & Texas Railway — approximately $900,000.

The comparative advantages — as well as the comparative cost — of the belt line proposition as the ultimate economic solution of the problem is so apparent as to require no argument and is therefore strongly recommended.

With proper co-operation on the part of the railroads, the belt line project can be speedily brought about.

The interests of the present industries along the railroad rights of way — as now located in the heart of the city — should receive serious consideration. These industries can be served by continuing the use of such tracks as may be necessary for the purpose under restricted operation until such a time as their removal to the belt line zone should be found practicable.

In another part of his report Mr. Wallace says: —

It is believed that the construction of a belt line for the use of all railroads entering Dallas and the ultimate removal of tracks within this belt line would be for the best interests of both the city and the railroads.

For the city, it would remove obstacles to its harmonious development and if some of the suggestions herein contained are adopted, would make possible an improvement in the city plan which would be very desirable.

For the railroads, the construction and operation of this belt line would solve the grade crossing problem at but a fraction of the expense of track elevation and would for all time solve the problem of railroad and industrial development in the city of Dallas.

Respecting the question of the operation of the belt line, Mr. Wallace said: —

The precise location of the portion of this belt and incidental terminal facilities to be constructed, together with the method of construction and operation, would seem to be matters which should be worked out by the railroads themselves.

The functions of the present Union Station Company might be extended to provide for the construction of this belt line and the taking over of the necessary trackage rights, or a new Terminal Company might be organized for this purpose. This Terminal Company could, in turn, lease trackage rights to the various railroads using the terminal or probably could perform a switching and terminal service for these railroads, somewhat after the manner in which the Indianapolis Union Terminal Company is operated, where the physical conditions are very similar to those existing at Dallas.

The Commission has been informed that the mayor of Dallas is arranging to have a fund created by a body of public-spirited citizens of Dallas, for the purpose of purchasing property adjacent to this belt line, the intention being to hold this property for industrial development and to guard any present or future industries in Dallas — which might seek locations along this belt line — against being exploited by real estate speculators.

Dayton, O.

Population, 1910, 116,577.

Belt Line. — No.

A belt line is contemplated which will almost entirely encircle the city. Plan is to create a belt by the construction of connecting links between present railroads.

Other Methods of Interchange. — Dayton is served by 4 trunk lines and 2 short lines. Each, with the exception of one short line, maintains centrally located freight stations for the handling of less than carload freight. The one exception has its freight handled in the station of one of the trunk lines. All these railroads operate through the central portion of the city over the tracks of the Dayton Union Railway Company what is com-

monly known as the "joint tracks." This confines railroad operations through the central section of the city to one double track railroad and eliminates many crossings. The joint tracks are about 2 miles in length. The Dayton Union Railway Company was organized about twenty years ago. The cost of maintenance and operation is definitely determined from year to year and periodically a wheelage record is taken to determine extent of use of all lines operating over tracks. Expense of maintenance, operation, improvement and interest on property is apportioned among lines.

Interchange Charge. — No information.

Proposed Improvements. — Belt line.

Denver, Col.

Population, 1910, 213,381.

Belt Line. — Yes.

Northwestern Terminal Railway Company owns and operates a belt line which has about 3 miles of main track and 9 miles of switching track. Upon this all the switching terminals of the Denver & Salt Lake Railroad are located.

Other Methods of Interchange. — Other connecting lines deliver cars to each other.

Interchange Charge. — From competitive points, the carrier which gets the line haul absorbs the switching charge. From local points the consignee pays the switching charge, a minimum of $3 a car, except that from one plant to another plant having no line haul, the switching is 25 cents per ton for each line handling the car. There is at present a case before the State Public Utilities Commission in which a number of Denver shippers have joined in a petition asking that the switching rates be reduced to a maximum of $3 a car.

Proposed Improvements. — No information.

Des Moines, Ia.

Population, 1910, 86,368.

Belt Line. — Yes.

The Des Moines Union Railroad Company, while not a belt railroad in the sense that it girdles the city, does a general switching business. The company was organized in 1884 and commenced business in 1888. It has never paid any dividends

to stockholders of outstanding stock ($400,000) but has earned a considerable amount applicable to dividends. These earnings have been used from year to year for purchasing property and constructing buildings and equipment.

The Des Moines Union Railroad Company is a terminal railroad company financed, owned and operated entirely independent of the railroads. It has terminals extending entirely across the city from east to west, together with a large number of industrial and service tracks. There is also the Iowa Transfer Railroad Company which is financed jointly by the Des Moines Union, Rock Island, Northwestern, Burlington and other roads, and is used to transfer freight from one line to another. Four switches are made through this yard each day for handling of transfer freight, each company having its own track or tracks in this yard and each one sending its own motive power or switching car through the yard to make the transfers.

Other Methods of Interchange. — Des Moines has seven trunk line railroads; three of these, the Wabash, Chicago, Milwaukee & St. Paul, and the Chicago Great Western, use the terminals of the Des Moines Union Railroad Company for all purposes. The Rock Island, Northwestern, Burlington, and Minnesota & St. Louis own their own freight terminals. The Burlington and Minnesota & St. Louis use the Des Moines Union passenger terminals, while the Northwestern and Rock Island have their own passenger facilities.

Interchange Charge. — In cases where freight originates in the tracks of one road within the switching limits and is to be delivered to tracks of another road within the switching limits of the road originating the business, a stated per ton rate is charged, depending upon the commodity or article handled, with a minimum of $4 per car. Of this the road to which the freight is delivered is paid $3 per car.

The amount of other interchange business between roads in Des Moines is very limited. It is handled through transfer companies on a tonnage basis at the rate of 5 cents per hundred pounds with a minimum charge of 15 cents. All railroads find it necessary to use the Des Moines Union very largely. There is an arrangement between the trunk lines by which (if gross earnings exceed $15 per car) the contracting line absorbs the switching charge and pays the Des Moines Union for making the switch. This applies to roads not using the Des Moines Union terminal facilities for terminal purposes.

Proposed Improvements. — None.

Detroit, Mich.

Population, 1910, 465,766.

Belt Line. — Yes, two.

There is an inner belt line on the east side of the city, controlled by the Michigan Central Railroad and an outer belt which swings in a circle around the outskirts of the city and practically outside of the city limits for a distance of 17 miles.

Other Methods of Interchange. — L.C.L. freight houses are distributed in various parts of the city in place of being in the central part of the city only, as is the case in many large cities. There are 27 freight houses in various parts of the city that accept inbound and outbound freight. In addition there are 58 team tracks, mostly paved, where carload freight can be loaded or unloaded to the great advantage of Detroit shippers and consignees. There is trackage room on these team tracks for 1,600 cars.

Interchange Charge. — Industries located on any line of railroad or belt line within the switching limits of Detroit, which embraces a district of about 12 miles across the city and 6½ miles in width, take the Detroit rate of freight. Upon through business which nets the carriers $15, they absorb each others' terminal switching charges and on some commodities they will absorb down to $10 net revenue. On switching business which originates within the switching district of the city of Detroit, the charges vary.

Proposed Improvements. — Extensive improvements are contemplated by officials and shippers.

Notes. — Detroit has had a comparatively recent awakening respecting the necessity of adequate terminal facilities. The traffic of the city became badly tied up during the winter of 1912. This caused the Detroit people to awake to the fact that while Detroit's industrial development and increase in tonnage within the previous ten years had been tremendous, the terminal facilities had not kept the pace and were inadequate to handle the volume of business thrust upon them. A Traffic Commissioner was secured and a terminal survey made. Recommendations were made by the Traffic Commissioner which caused the heads of industries to see the necessity for improvement, and about $7,000,000 was spent within the city on new extensions for terminal improvement. Many industries spent from $50,000 to $125,000 to add trackage or other property. This work is still continuing.

In Detroit there are some 2,700 firms, corporations or individuals engaged in manufacturing, jobbing and other commercial pursuits. Of these, 765 industries are of sufficient importance to have their own private side tracks leading from the various belt lines or railroads.

Galveston, Tex.

Population, 1910, 36,981.

Belt Line. — No.

Other Methods of Interchange. — There is a corporation known as the Galveston Wharf Company which owns most of the facilities at Galveston for the handling of export, import and coastwise traffic between the railroads and vessels, and the tracks of which connect all railroads entering Galveston. This company operates 50 miles of railroad track, and the same system of interchange prevails between the company and its connections as between other terminals and their connecting lines, cars being delivered to this company on designated interchange tracks on their terminals, and traffic for the railroads being delivered by the company to designated interchange tracks on the terminals of the roads.

There is another company, the Southern Pacific Terminal Company, which is a subsidiary of the Southern Pacific Railway Company. This corporation handles coastwise traffic of the Morgan Steamship Line and also operates one large elevator and serves some industries.

Each of the railroads entering the city does some interchanging.

Interchange Charge. — The charges of the Galveston Wharf Company range from $1.75 to $5 per car on ordinary freight. The company charges for cars from junctions with connecting lines to all points on the Galveston Wharf Company property on all commodities originating at Galveston or points beyond, $1.75 per car. From all points on the Galveston Wharf Company to junctions with connecting lines the delivery at Galveston except on import grain is $5 per car. The General Agent for the Galveston Wharf Company stated that the switching charge is in all cases absorbed by the carriers.

Proposed Improvements. — The Galveston Wharf Company now has under construction a new concrete two-story pier, 1,200 feet in length, 150 feet in width at the shore end and 425 feet in width at the harbor line. There are no other improvements under construction at the present time.

Notes. — Galveston is located on an island a little more than two miles from the main land. Its wharf frontage is on Galveston Bay on the north side of Galveston Island at its easternmost extremity.

All of the railroads enter Galveston over a causeway extending from the main land to the island. These roads are the Gulf, Colorado & Santa Fé, main line, Galveston, Houston & Henderson, the International & Great Northern, Missouri, Kansas & Texas, and the Galveston, Houston & San Antonio (Southern Pacific System). The Santa Fé also has a line running from Beaumont down Bolivar Peninsula to its terminals at Port Bolivar, and freight from there is ferried across to Galveston to the Santa Fé property at the eastern end of Galveston Island.

The total length of the dock frontage in Galveston is about 2¼ miles, but owing to the fact that the slip system is employed, there is a wharf frontage of about 5 miles. The Galveston Wharf Company owns 30 blocks on the water front, from 10th to 41st streets, all of which is improved on the slip system. The Southern Pacific Terminal Company owns 10 blocks of water front from 41st to 51st streets. This, too, is all improved. From 51st to 61st streets the water front is owned by the Rock Island system and is not improved; and from 61st Street west the property is owned by private individuals and has no improvements of any kind on it. East of 10th Street (the Galveston Wharf Company property) the water front for about ten blocks is owned by the Santa Fé system. This has some minor improvements upon it. Opposite almost the entire water front of Galveston, and distant from it about 2,000 feet, is an island known as Pelicans Pit. It is triangular in shape and has a water front of about 15 miles. This is the property of the city of Galveston and is at the present time unimproved except for several individual properties located there by grant or lease from the city.

The Galveston Wharf Company is a stock company having several hundred subscribers. The city of Galveston owns 20 per cent. of the stock of this company and has a representation of two on the Board of Directors. This 20 per cent. interest was secured when the ends of certain streets which led to the water front were closed and conveyed by the city to the Wharf Company in consideration for this stock. The total stocks and bonds of the Wharf Company are slightly in excess of $5,000,000. The value of the property was determined recently by the State Railroad Commission engineer as slightly in excess of $10,000,000.

The company, besides making many improvements, has been paying a dividend of about 3 per cent.

The Southern Pacific Terminal Company stock is owned entirely by the Southern Pacific Company of Kentucky.

The Galveston Wharf Company controls its own rail lines on its terminal property and operates its own switching engines. According to the General Agent of the company the average number of loaded freight cars handled per day by this company during the year 1915 was 427.

Grand Rapids, Mich.

Population, 1910, 112,571.

Belt Line. — No.

Other Methods of Interchange. — Freight is handled by the railroads themselves, the roads doing all of the interchanging.

Interchange Charge. — Railroads by agreement absorb switching charges, the road with the line haul standing the expense in most cases. In this way the shipper and consignee are not penalized. Railroads have also published an arrangement taking care of what is known as the "industrial switching movement" within the city limits, whereby there is a charge of 1½ cents per hundred for industrial switching. This is a substitution for drayage.

Proposed Improvements. — None.

Notes. — The city has a union station centrally located which is used by three railroads as a passenger terminal. The Grand Trunk has its own passenger station, also centrally located, as has the New York Central.

Houston, Tex.

Population, 1910, 78,800.

Belt Line. — Yes.

The belt road is owned and operated by 4 of the 17 railroads which enter the city. They conduct what is known as the belt terminal on a co-operative basis. This belt terminal does the passenger and freight switching of these companies and also handles the passenger service of another railroad. The owner lines pay the expenses of operating the belt in proportion to the business they do and the road whose passenger service is handled by the belt pays a contract price of $1,250 a month to the

belt terminal, which sum is credited to the cost of maintaining the passenger service.

The belt line goes about two-thirds around the city and connects with all roads. It has 32 miles of main trackage. Eight miles of the road is double tracked, the single track being on the outside of the city. The belt handles about 600 cars a day and uses four engines for freight work in ordinary times and seven in busier periods. In the fall the belt handles about 250 freight cars a day. When it was inspected by the Commission, it was handling about 125 freight cars daily. The belt road has an assembly yard where the interchange work is done. It was stated to the Commission that about $5,000,000 is invested in the belt line. The belt line owner companies themselves have not been paying propositions; three of them are now in the hands of receivers.

The city of Houston has constructed railroad tracks at the site of its big docks and at the site of its other proposed waterfront improvements. These tracks connect with the belt line. The railroads wanted to lay them, but the city officials declined to permit this.

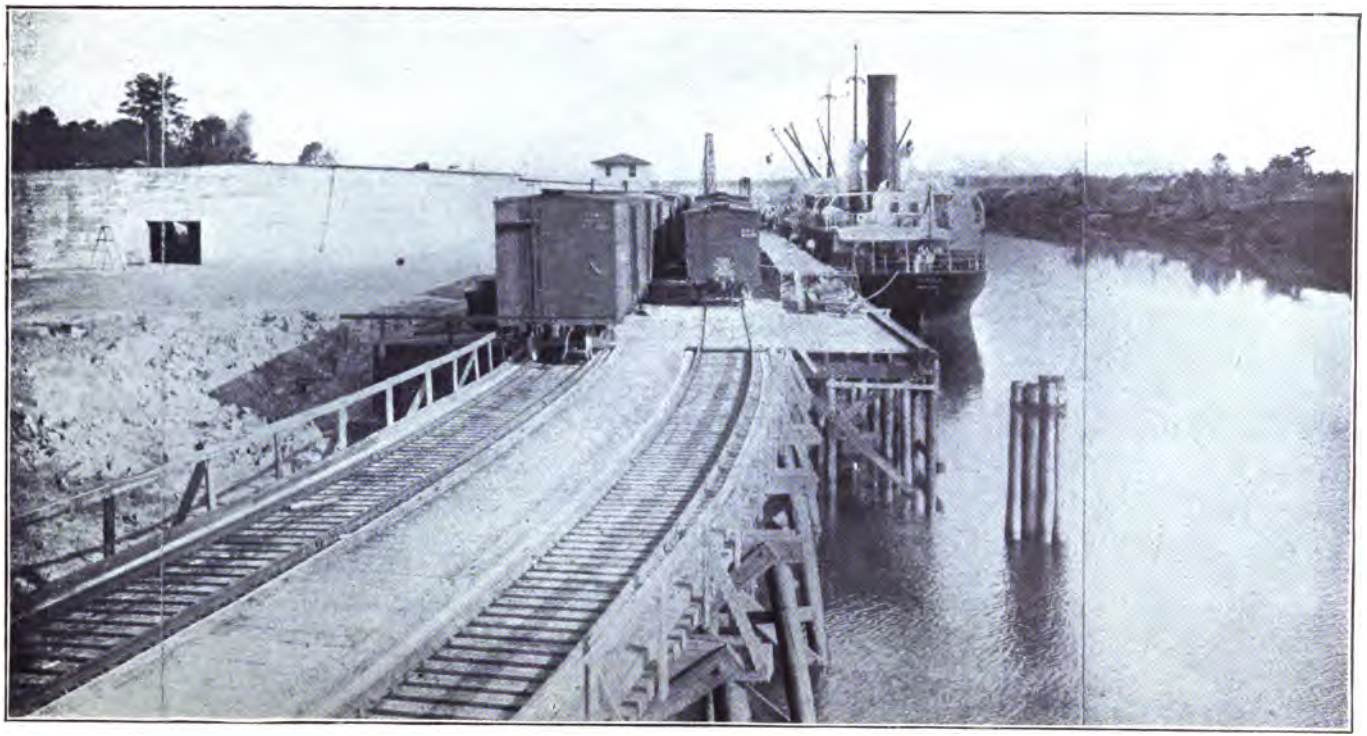
Other Methods of Interchange. — The other 13 railroads do their own switching.

Proposed Improvements. — The city is building three cotton sheds on the river front, each 750 feet long and 125 feet wide and two stories high. It is also planned by the city officials to construct two more reinforced concrete freight houses and two big grain elevators. In conjunction with the government, the city is busy widening and deepening the Houston Ship Channel.

Notes. — Houston has already expended $1,250,000 for the dredging of its ship channel and a like amount was appropriated by the government. The city has appropriated $250,000 and the government $250,000 for the building of two dredges. The government has been given title to the dredges, the understanding being that both will be kept employed in the channel.

The city has already built one reinforced concrete freight house, 450 feet by 125 feet and one story high, at a cost of about $165,000.

Two miles of water frontage on each side of the river is owned by the city and it is there that it is carrying out its very ambitious scheme of river development. The city docks are given over to the free use of shipowners, no charge for wharfage being made. The only charge is for storage.



Municipal Wharves and Municipal Railroad Tracks at Houston.

Indianapolis, Ind.

Population, 1910, 233,650.

Belt Line. — Yes.

The belt line encircles the city. The Indianapolis Union Railway, known as the Belt Railway, serves all the railroads and performs needed service between them. It also serves many industries located on the belt.

Other Methods of Interchange. — Seven railroads serving Indianapolis maintain separate freight terminals and merchandise freight houses. L.C.L. freight is handled through freight houses except part of the outbound freight which is loaded into trap cars at elevators by shippers and switched direct to trains for movement.

Interchange Charge. — On through traffic the line of the road haul assumes the expense; on local traffic to and from junction, the charge is added and paid by the consignee at destination. The carload interchange switching charge is between $2 and $3 per car.

Proposed Improvements. — None.

Jersey City, N. J.

Population, 1910, 267,779.

Belt Line. — No.

Other Methods of Interchange. — There are ten railroads with terminals in the city. These serve as main railroad terminals for New York. Like New York, most of the interchange service is by car float and lighter, very little being done between railroads.

The Morris Canal serves as a barge water way.

Interchange Charge. — Railroads absorb cost of lightering and car floating to and from New York. No information as to local interchange cost.

Proposed Improvements. — Public belt railroad is planned by city officials and it is advocated by local business men's organizations. It is planned for this railroad to run along a large part of the more important water front, connecting all of the railroads in the city. Plans provide that the main stem of this road shall be 5 miles; that it shall have sidings of 16 miles; at a total cost of $1,500,000; and which serve a total area of 15,264,832 square feet. Plans include the financing of the road by the city at a yearly cost of $116,250, including interest and

sinking fund. The money is to be raised by 20-year bonds at 5½ per cent. and it will be operated either by the city or by private interests. The plan is to have an electrically operated road with overhead trolley or storage battery or both. The road is advocated on the ground it would increase ratables by at least $50,000,000, and attract industries and people to Jersey City. It would save time and money to manufacturers, produce additional freight for the railroads and aid the city.

The advocates of the project state that the plans include a publicity fund to aid this proposed additional railroad facility and incidentally Jersey City.

Kansas City, Mo.

Population, 1910, 248,381.

Belt Line. — Yes.

There is a new belt line operated by the Kansas City Terminal Railway Company, a regularly incorporated company which does a terminal business, the stock of which is owned by eleven railroads, each owning an equal amount and their presidents being the directors of the terminal company. The belt line is not yet wholly completed as far as its making an actual belt is concerned, but the company's officials say they plan to complete it eventually.

Other Methods of Interchange. — All railroads entering Kansas City do a great deal of their own freight switching.

Interchange Charge. — The cost of freight switching varies; some of it costs $5.50 per car, and some $3 per car, while on freight originating on the terminal company's tracks and hauled to some other part of the city a charge of $9 a car is made, this being for cross-town hauls.

Notes. — The Kansas City Terminal Company operates the Kansas City passenger terminal which cost between $38,000,000 and $40,000,000 and which was opened in November, 1914. This is a Union Station and does the passenger terminal business for the Chicago & Alton, Rock Island, Missouri Pacific, Union Pacific and Wabash roads. The company takes complete charge of the passenger rolling stock of these roads, handling all of the engines and doing all of the cleaning and repairing of cars. It also does the switching for the Burlington road and takes trains from the station to the coach yards and back. It owns the terminal tracks and charges the railroad company for the use

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of the same on a wheelage basis. This company has not yet got a clearing yard. Its officials say that if it had, they are of the opinion that it could do the freight switching much better than the railroad companies. They stated also that the company is working with a view to eventually taking over all of the terminal work, both freight and passenger. As yet this is not an interchange company.

Los Angeles, Cal.

Population, 1910, 319,198.

Belt Line. — No.

Other Methods of Interchange. — The three steam transcontinental railroads, the Southern Pacific, the Atchison, Topeka & Santa Fé, and the San Pedro, Los Angeles & Salt Lake railroads interchange freight by transfer or interchange tracks. It takes an average of about twenty-four hours to make interchange deliveries.

Interchange Charge. — Carload freight on each line is switched to all industries upon that line without any additional charge. Freight originating at common points of any transcontinental territory east of El Paso, Albuquerque and Ogden is switched to industries on any line without charge to the shipper or consignee, the charge being absorbed by carriers enjoying line haul. The charge for this switching is $2.50 per car.

On freight from non-competitive territory when switched to connecting line, connecting line delivering cars assesses a charge of $2.50, which industries must pay.

L.C.L. freight when received by one line destined to points on another line outside the city is delivered by that connecting line daily by transfer without any additional charge, the through rate taking care of same.

Proposed Improvements. — The city and Board of Public Utilities are now considering plans to solve problem of congestion. Suggestions have been made for construction of a viaduct and tunnels.

Notes. — The three local depots and team tracks are located from one mile to one mile and a half from the center of the city.

The hours for receiving freight at these depots and team tracks are from 7 A.M. to 4.30 P.M., after which hours no teams are permitted inside of the "dead" line. Teams arriving before that time are unloaded regardless of time necessary to do so.

About 700 industries are located upon various lines where carload freight is delivered.

There are received for private industries and forwarded from private industries about 420,000 cars per annum. Team tracks receive and forward about 200,000 cars per annum. There is an electric railway system handling suburban freight for a distance of 60 miles. This line handles in and out of the city approximately 200 cars a day, included in which are 45 cars of less than carload freight.

There is some delay in reaching depots for receipt and delivery of less than carload freight to some of the team tracks. Some business men say this is largely caused by poor arrangement of the interurban car system.

Los Angeles, which was originally an inland city located about 21 miles from the Pacific Ocean, has made itself a Pacific port by the annexation of a strip of territory between its original boundaries and the sea and by consolidation with near by coast towns.

The harbor is administered by a Harbor Commission which was established in 1910. This consists of three commissioners appointed by the mayor for terms of four years each. Each commissioner is in charge of a department, the departments being as follows: Bureau of Instruction and Maintenance, Bureau of Traffic and Commerce and Department of Operation and Control. This Board is charged not only with the development of the harbor and the construction and operation of municipal harbor improvements, but is also required to build up the commerce of privately owned utilities.

In consequence of the consolidation of the harbors of San Pedro and Wilmington, the Harbor Commission is obligated to spend $10,000,000 on harbor improvements within the ten years from 1909. Harbor improvement bonds amounting to $5,500,000 have been sold since 1912 and the money expended on the construction of wharves, freight sheds, terminals, paved approaches, dredging, etc.

Louisville, Ky.

Population, 1910, 223,928.

Belt Line. — Yes.

On the western side of the city there is a large terminal company known as the Kentucky & Indiana Terminal Railroad Company. This is strictly a terminal company and is owned jointly by the Monon, Baltimore & Ohio and the Southern rail-

roads and is used by these lines as their local terminal. The Terminal Company, which is operated at cost to the three proprietors, also performs switching service for others at a regular published tariff rate.

The terminal is operated on what is known as a deficit basis; that is, the three proprietors pay all expenses over the small amount of revenue earned, apportioned to each tenant proprietor on the basis of its use of the terminal facilities.

The functions of the road are general terminal switching, industrial switching, interchange between tenants and connections, running maintenance and care of tenants' equipment.

The company has a very large double track bridge across the Ohio River. It has encouraged the building of new industries by furnishing industrial spurs and ready transportation service over the various lines, regardless of competition.

Other Methods of Interchange. — All lines maintain interchange tracks on through business. The line by which the car arrives and is to be interchanged places it on its interchange track. The line which is to continue the haul empties this track two, three or four times a day, as may be found necessary. Business is largely north and south bound.

The Louisville & Nashville Railroad lines around the eastern and southern part of the city have a large number of private side tracks located on that part of their line within the switching limits. On inbound business there is no charge for switching carloads arriving by Louisville & Nashville and destined to those private side tracks. Carloads arriving by some other line are also placed on these side tracks by the Louisville & Nashville.

Interchange Charge. — The switching charge of the Louisville & Nashville is from $1 to $5, depending on the distance. This road will not switch competitive business to private side tracks on its line in Louisville over a competitive line. In such cases the line getting the road haul absorbs the drayage. L.C.L. freight is moved whether inward or outward bound to or from various depots, as the case may be, at the expense of the shipper.

The Kentucky & Indiana Terminal Railroad Company prorates the cost of interchanging. The average charge made for the interchange service by the Kentucky & Indiana Terminal Railroad Company to its tenants is the actual cost to the Terminal Company, whatever that may be, but to others than tenants the charge is per published tariff and amounts to about $2. The tenant companies pay their accounts monthly for all switch-

ing service performed for them on a cost basis, and others than tenants pay for each car as it is moved by switching tickets which they purchase in lots at intervals preceding their use.

Milwaukee, Wis.

Population, 1910, 373,857.

Belt Line. — No.

Other Methods of Interchange. — The railroads do their own interchanging and have their interchange platforms for L.C.L. shipments and tracks for C.L. shipments. The interchange cost is generally covered by absorptions and rates which are taken care of by agreement for rate divisions made by several carriers, which Traffic Secretary of Merchants and Manufacturers Association stated are not disclosed.

Interchange Charge. — No information.

Proposed Improvements. — None.

Notes. — The city is served by some 30 odd railroads and steamship lines. It is one of the leading ports of the Great Lakes. It is the terminal station of the Chicago & Northwestern Railway. It is an important terminal and transfer interchange point of the Pere Marquette Railroad, of the Grand Trunk Railway system and of a number of other small railroads.

Minneapolis, Minn.

Population, 1910, 301,408.

Belt Line. — No.

Other Methods of Interchange. — Each of the nine trunk lines entering Minneapolis has its own facilities for handling freight. As at St. Paul, a very large part of the C.L. and L.C.L. freight is interchanged at Minnesota Transfer, which is located midway between the cities of St. Paul and Minneapolis and operated by the Minnesota Transfer Railroad. This is a terminal and switching road owned by the nine railroads entering the twin cities, and is operated for interchange purposes. It also affords service for local industries.

There are three switching lines serving the central milling district of Minneapolis, the Minneapolis Eastern, Railway Transfer and Minneapolis Western. These serve the mill industries. As a general rule, each of the trunk lines makes up and breaks up its trains in its own big central classification yard, capable of accommodating numerous trains and holding many cars.

Incoming trains are split up in the classification yards and taken to different sections of the city, while outgoing cars are taken from industries, connecting line transfer points, team tracks, etc., to the same yard and there classified into different trains for forwarding.

In interchanging cars at Minneapolis, railroads transfer cars to one another through a connecting carrier where direct connection is not possible, but in most cases the terminal facilities of the lines afford direct connections.

During 1915 there were received and forwarded at Minneapolis 752,392 cars, and in 1914, 700,037 cars. In addition to these, a large number of cars were handled in the Minneapolis terminals exclusively in switching service, such cars moving from the elevators to the mills.

Interchange Charge. — The average switching charge in Minneapolis is $1.50 per car, *i.e.*, on cars coming from or going beyond Minneapolis. On purely switching movements, the rates vary from $5 per car up to a stated amount per hundredweight, according to distance. All deliveries are made free from industries located on lines receiving the line haul. Where cars are interchanged between railroads through a connecting line, switching charge of the connecting line is $1.50. A number of the Minneapolis lines absorb all switching charges where they receive a minimum per car of $15. Others absorb switching charges only on competitive traffic; in other words, where switching charges would not accrue if cars were handled by any other line. On lines where traffic is not competitive, the switching charges are paid by the industry and included in the freight bill.

Cars brought in by one line for delivery to an industry on another line can, on the average, be set at the industry within 24 hours after the arrival of cars at Minneapolis. In cases of some industries which have more than one switch a day, cars are set the same day as their arrival. The service is much quicker where the delivery is to an industry on the line bringing the car to Minneapolis.

Proposed Improvements. — Several roads have plans for greater and more up-to-date freight receiving and shipping houses and other enlargements of their facilities. These, however, have been laid aside during the last few years because of the general business conditions, but every year, according to the Traffic Association, finds considerable yard room added by each railroad.

No general plan for the improvement of the freight terminal facilities at Minneapolis has been put in motion as yet, and though the matter has had some consideration, it has not gone far enough to include anything definite. A few years ago, a movement was started for more adequate passenger terminal facilities at Minneapolis, but this matter is still pending. Recently the city council has given considerable attention to a project for the development of the river terminals.

There are four different passenger stations in Minneapolis and efforts are being directed towards bringing all lines into one station.

Notes. — According to officials of the Traffic Association freight handling in Minneapolis is generally regarded as good by the business interests, except during the fall when the heavy grain movement and natural increase in business severely taxes the terminals of the city, and except in cases where some particular facility is limited.

Newark, N. J.

Population, 1910, 347,469.

Belt Line. — No.

Other Methods of Interchange. — Railroads do their own interchanging, some of it by lighters and car floats.

Interchange Charge. — No information.

Notes. — The city of Newark is building a municipal terminal railroad, a part of which is already constructed and which when finished will connect the Pennsylvania and Jersey Central and Lehigh Valley railroad systems. It is planned later to extend the road to make connection with the Erie & Lackawanna Railroad.

The city is building a system of dockage to extend a total length of 4,500 feet. In connection with this dockage system, it is planned by the city to build piers 1,200 feet or more in length. The city is at work reclaiming meadow lands, and the plans include the development of a large industrial section to be served by the Municipal Terminal Railway. The plan is at present for the city to lease factory sites and water-front facilities under certain conditions and reservations.

Under a special act of the Legislature, the city has been authorized to expend upwards of $2,000,000 in the construction of the first unit of this development.

New Orleans, La.

Population, 1910, 339,075.

Belt Line. — Yes.

New Orleans has a public belt railroad which is a terminal switching road owned and operated by the city under constitutional and legislative authority. The road is managed by an unpaid commission of seventeen menbers: eleven of these are designated by commercial exchanges of the city and five appointed by the mayor from the city at large. The mayor is ex officio president of the Commission.

The belt was built and is operated with a view to connecting with all railroads entering the city for the purpose of supplying economical and non-discriminatory switching service to the railroads and industries. The road has been in operation since 1908. While it has about 40 miles of track it is by no means completed and does not yet directly connect with some of the railroads. It has, however, indirect connection with such roads as it does not directly touch. It is planned by the city officials to eventually belt the city, and the work in this direction is progressing. The road has ten miles of double track along the active section of the water front where it has exclusive track connections with all of the public wharves.

The belt road also serves private individuals and firms through industrial spur tracks and has eleven team tracks. It operates ten engines and has ordered five more.

The Public Belt Railroad is a member of the Freight Agents Association, Freight Claim Association and Per Diem Rules Agreement of the American Railway Association. In its relations with the shipping public and its railroad connections, it assumes full transportation obligations and enjoys the confidence and co-operation of both.

The following shows the financial standing of the road for 1914: —

Gross earnings for the year ending Dec. 31, 1914, . . .	$321,418 44
Expenses of maintenance and operation, same period, . .	251,719 58
Net revenue for the year ending Dec. 31, 1914, . .	$69,698 86
Less charges of reserve for accrued depreciation on locomotives, ...	6,634 71
Surplus, ...	$63,064 15

A bond issue of $2,000,000 was authorized for the construction of the road. About $1,000,000 has been thus far expended. The earnings of the belt line are supposed to pay interest charges and pay off the bonds as they come due.

Theodore Brent, general manager of the New Orleans Joint Traffic Bureau, told the Commission that the whole backbone of the terminal port facilities of New Orleans is the public belt line. He said that without a belt line a city cannot hope to get anywhere, nowadays, and that a belt line places the shipper in direct touch with the water front and all other railroads, a feature which is necessary for the free expansion of business. The industrial development that will accrue to New Orleans from the belt line, he said, will be tremendous.

Mayor Behrman said the original capital put into belt line amounted to $500,000 and was appropriated from the city treasury. Bonds, he stated, sell at a premium. Mayor Behrman said also that at first the railroads objected to the public belt line and that the city officials had to make a show of force and resort to strategy to get the actual work of constructing the road started. Now, however, he said, the city officials have the active co-operation of the railroad officials, whose roads cannot do the switching for each other as cheaply as does the belt.

Mayor Behrman said he felt that the municipal ownership of a belt line is necessary in order to insure to a city the full measure of success.

City Attorney I. D. Moore, who is ex officio legal advisor of the belt road, said that the work being done in connection with the construction of docks and warehouses, while excellent, would be virtually useless without the public belt road. He declared that the belt road now hauls 162,000 cars per annum and that during the month of July it yielded a net return of over $12,000.

Other Methods of Interchange. — Some of the railroads do a little of their own interchanging.

Interchange Charge. — A flat rate of $2 per car is charged for switching as against from $8 to $20 a car prior to the starting of the belt line. The $2 rate includes the haul of the loaded car and the return of the empty, and vice versa.

On carload competitive traffic received or forwarded via the New Orleans Public Belt Railroad for or from industries, switches and warehouses located on the tracks of the belt line the switching charges are absorbed by the connecting railroads as are the

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charges for interchanging between railroads. The rate on coaches, baggage and caboose cars is $5 per day, while the rate on locomotives, dead or under steam, steam shovels and derricks is $6. A charge of $3 per car is made for the use of cars furnished by the Belt Railroad for loading to points within the switching limits of New Orleans.

Notes and Proposed Improvements. — As the result of decrees of the early French officials and under the terms of the Louisiana Purchase, the ownership of the entire river front of the Port of New Orleans lies in the State. Not a foot of river-front property is owned by private persons. Under legislative and constitutional enactments the complete control and government of the port and harbor of New Orleans, a river frontage of 41 miles, was, in 1896, given over to an unpaid commission of five members appointed by the Governor. This Commission has plenary powers and is charged with the duty of extending and improving the port and harbor of New Orleans and the development of commerce. It has power to construct wharves, warehouses and elevators and all other necessary structures to facilitate the business of the port; to make ordinances governing the operation of the port; to fix all dock charges; and to regulate all of the shipping of the port.

When the Commission took control of the port, the river front was lined with old wooden piers controlled by lessees. Since then the Commission has acquired all dock facilities of the port with the exception of about 2,049,900 square feet, which is operated by three railroad companies, the Illinois Central, Texas & Pacific Railway Company and New Orleans Terminal Company. The latter property is used by the Queen & Crescent, New Orleans Great Northern and New Orleans, Texas & Mexico railroad companies.

The publicly owned wharves cover nearly 3,794,870 square feet. Officials say that they estimate that $20,000,000 has been saved to the port because of the fact that the title to the river-front property never passed out of the hands of the State. In acquiring property held by lessees, the Port Commissioners only pay for the improvements to the original property up to low water mark.

The Port Commissioners were authorized to expend $25,000,000 for carrying out a broad and comprehensive scheme of port development which has already resulted in the construction of modern docks, wharves and steel sheds, costing $4,465,209.07,

and are engaged in the construction of modern reinforced concrete steel warehouses to cost $3,500,000. They also have plans for great coffee, lumber, grain and general warehouses to cost approximately $3,000,000, and a grain elevator to cost $1,500,000.

In addition to this, the Commission plans to expend $1,500,000 on a canal to connect Lake Pontchartrain, an arm of the Gulf back of the city, with the Mississippi River.

The Commission, among other things, is constructing a waterfront freight terminal yard which will have a capacity of approximately 2,500 cars and will be sufficient to accommodate a daily movement of 1,000 loaded cars. It was stated to the Terminal Commission by the members of the Port Board that the development of the port is not costing the citizens of either the city or the State a dollar in the way of taxes. Money for improvements is raised by a bond issue covered by a blanket mortgage on the improvements and the revenue from the operation of the port must be sufficient to pay the interest on these bonds and meet them when they come due; also to pay running expenses of the Port Commission.

The report of the Port Commission for the year 1914 states that the revenue exceeded the expenses, including interest on bonds, by $32,168.94.

New York, N. Y.

Population, 1910, 4,766,883.

Belt Line. — No.

City plans municipal belt line in South Brooklyn to connect industries and railroads there, the road to be constructed and owned by the city and operated by joint board made up of representatives of all railroads.

Other Methods of Interchange. — All freight interchange at New York is by car floats and lighters. But one of the eight trunk lines entering the city delivers freight in the city proper by rail. Interchange charges are absorbed by railroads without cost to the shippers or consignees.

Proposed Improvements. — In addition to the belt line, the city is spending many millions of dollars in the construction of new wharves and docks. The placing of the New York Central freight lines under ground is also contemplated and a great bridge over Hell Gate to connect the New Haven and Pennsylvania railroads is being completed.

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A Commission of three experts has been appointed to make an investigation of the terminal needs of New York and to recommend such improvements as its members deem necessary. This Commission is comprised of 2 engineers and one railroad expert. The appropriation for this investigation is $125,000 a year for two years. Studies have been made by the Department of Docks and Ferries for a big combined dry and wet dock in South Brooklyn to be 1,100 feet long. It is planned that when not in use as a dry dock it can be used as a commercial pier.

Notes. — Eight trunk and half a dozen local lines feed city. Three trunks run passenger trains into passenger stations in New York proper; the rest have their main terminals on the mainland and ferry passengers to the city. New York has the most extensive car float, lighterage, and barge service in this country. It is estimated that there are about 11,000 freight-carrying craft operating in the waters contiguous to New York.

Since 1871 the city has been carrying on the policy of securing ownership of its water front. It now has about 250 publicly owned docks and piers which represent a value of more than $150,000,000. The city, through the Department of Docks, exercises general control of all construction work undertaken along the water front of New York, whether the same be done by private parties or public authorities. Plans for all construction work of whatever nature along the water front must be first submitted to this department for approval. The department has been in existence since 1870 and is headed by a commissioner appointed by the mayor. It employs about 2,000 persons. Among other things, the department is charged with responsibility for city-owned piers, cleaning of the marginal street, the operation of city ferries in New York, and supervision of all construction work of piers. In 1915 the department expended $2,000,000 to administer the board. While most of city's piers are leased, several are maintained as open piers, to which any one can bring his boat, tie up, load and unload cargo at a nominal cost. The average boat can tie up to one of these piers at a cost of 50 cents a day. The city charter provides that a Sinking Fund Commission comprised of the mayor, comptroller and chairman of finance committee of board of aldermen may lease piers owned by city for terms of ten years with maximum of four renewals. The city has already expended over $100,000,000 to connect it with the main land by bridges. In the past two

years the city has begun work, some of which is already completed, which will provide nearly seven miles of public wharfage space. The new piers will provide 1,973,000 square feet of dock space. This includes a pier at 46th Street 1,000 feet in length, 150 feet wide with a slip 360 feet in width; a half pier at 44th Street 1,000 feet in length with a slip 360 feet wide; a battery of three piers at 29th, 30th and 35th streets, South Brooklyn; the latter pier is to be 1,740 feet by 175 feet wide and it is said will be the longest commercial pier in the world.

The Department of Docks and Ferries by arrangement with railroads has provided for the construction of a number of other modern railroad piers. The department is to acquire the land, and the railroads to build the structures, and pay for them by amortizing the cost at a fair rental rate. These piers on the expiration of the leases will revert to the city. The city reserves the right to take this property at any time within ten years by paying for improvements less the cost amortized. In 1914 the city's rentals on its water-front property amounted to $5,080,-445.89. The total gross revenue of the Department of Docks and Ferries in 1914 amounted to $6,177,233.10, while the total audited expenditures of the department for the same period were $4,495,730.22.

At New York there are many private terminal companies which are operating throughout the harbor. The most notable of these are the Bush Terminal Company, the New York Dock Company, the Jay Street Terminal and the Brooklyn Eastern District Company. The two former are the largest of these companies. Both are located in Brooklyn.

The Bush Terminal which is said to be the most complete terminal in the world covers many acres and includes a residential district where live the workmen employed in the various industries which have located at the terminal.

The terminal includes seven large piers; ten large factory and warehouse buildings, eight six stories and two eight stories, and each 750 feet long by 150 feet wide. It operates a railroad which has 25 miles of track with its own engines and some 2,000 cars.

This plant is said to represent an expenditure of $25,000,000.

The company lets space in its buildings to tenants and has some 250 of the latter. It takes the outward freight from the shipping doors of its tenants and brings shipments destined for these tenants right to receiving doors of the latter. It does not charge for porterage or cartage and its tenants get the flat New

York rate. A large proportion of the shipments to and from the property are lightered to and from the Bush Terminal piers by the railroad companies, the railroads absorbing the charge for this service in the through rate. Ships from all over the world dock at this terminal.

Oakland, Cal.

Population, 1910, 150,174.

Belt Line. — No.

While there has been considerable talk of a municipal belt line, the project has never taken shape. The suggestion has been made that public interest will ultimately demand the taking over of all freight terminals and their operation by a belt line company, prorating the expense in some agreed way among the different lines. The Southern Pacific Company's lay-out, as operated, gives it practically a belt line.

Other Methods of Interchange. — All the railroads have their own terminals and do their own interchanging. The San Francisco, Oakland terminal railways have transfer tracks with the Western Pacific, Santa Fé, Southern Pacific, and Oakland-Antioch & Eastern Railway Company.

Interchange Charge. — Each line switches for the others within switching limits for $2.50 per car. On competitive traffic this is absorbed by the other line and on non-competitive traffic it is added to the freight rate.

Proposed Improvements. — A representative of the Industrial Bureau of the Oakland Chamber of Commerce states that it is expected that ultimately between $20,000,000 and $25,000,000 will be expended to carry out a system of water-front development which has been begun.

The terminal facilities for water carriers are being improved greatly. Since 1910 the city has expended some $2,503,000 in laying the foundation for an extensive water-front system. The first unit in this system will be opened up for the accommodation of commerce in a short time. Much of the water-front land is owned by the city and leased to private corporations.

Notes. — Oakland is just across Frisco Bay from San Francisco. Three transcontinental railroads have terminals there. These are the Southern Pacific, the Atchison, Topeka & Santa Fé and the Western Pacific companies. One suburban line, the Oakland-Antioch & Eastern railway, which extends to Sacramento and connects with other lines, thereby focussing 300 miles of electric railway at Oakland, also has its terminals in this city.

The Southern Pacific Company has the most extensive trackage. The freight trains of this road enter the city from two directions. Their rails as a general thing extend along the water front on the west as well as on the south and southwest. Freight trains are broken up at their main terminal at Kirkham Street, and the cars forwarded to various sections of the east bay cities by switch engines and to San Francisco by car floats. The Atchison, Topeka & Santa Fé railway has one terminal at 40th Street and San Pablo Avenue, which serves a large industrial district. It is developing a new 30-acre terminal on the inner harbor to and from which their traffic is handled by car floats from Richmond. The majority of freight on this road goes into 40th Street and San Pablo Avenue, and there is spotted on team tracks and industrial sidings or transferred to connecting lines for delivery.

The Western Pacific enters Oakland from the southeast and has its principal freight station at 3d and Harrison streets. Freight trains are broken up in the yards at the foot of Adeline Street. Car ferries handle the San Francisco freight.

The Oakland-Antioch & Eastern railway — an electric line — receives and delivers freight for Oakland at 40th Street and Shafter Avenue, and makes deliveries of carload traffic to other railroads through the San Francisco and Oakland Terminal railways. Cars are transferred in Oakland once a day, generally in the afternoon.

Philadelphia, Pa.

Population, 1910, 1,549,008.

Belt Line. — Yes.

A privately owned but practically publicly controlled belt line is operated along seven miles of the water front. This road was incorporated in 1891 by public-spirited citizens who were alarmed at the danger of railroad monopoly of the water front. Fifty-one per cent. of its stock was placed in trust for the city and is voted by trustees, the majority of whom are elected by the principal business organizations. The road does not do an operating business. It owns tracks but has no other equipment. The trunk lines do the interchanging and charge each other between $2 and $4 per car for two-way movements. The business of the road has increased from 456 cars in 1895 to 19,656 cars in 1913. The expenses of the belt are borne by the trunk roads which use it on a pro-rata basis. There is no charge to shipper or con-

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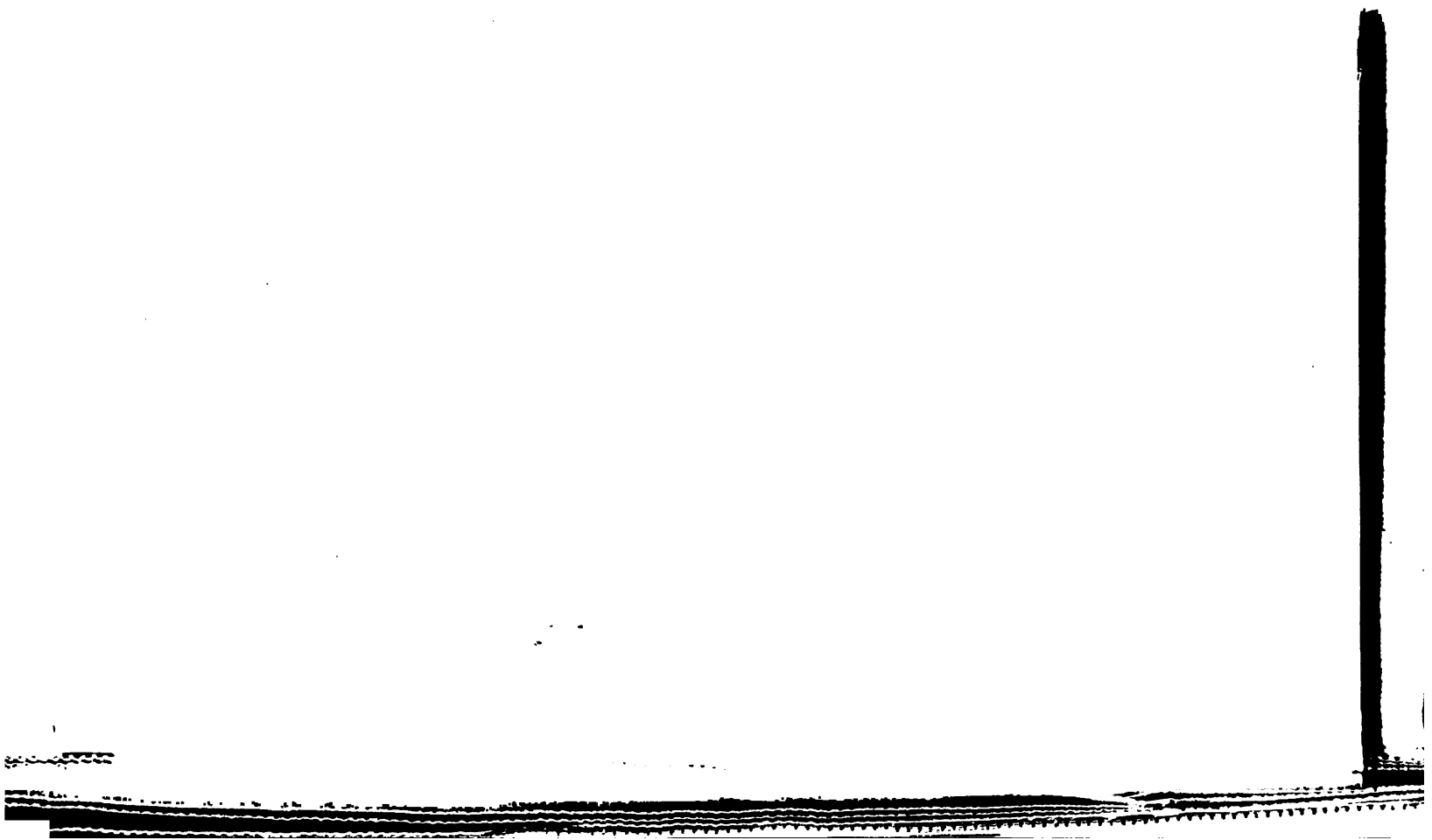

signee for switching done over the belt, as the railroads absorb the switching charges. Thus industries on the belt line get the flat Philadelphia rate. The belt has never declared a dividend, the original subscription, which was small and merely to cover the law, being practically a donation. The road has cost but little. The trunk lines advanced money to do the construction work. City officials say that the belt railroad has worked wonders for Philadelphia and that it has made the railroads tolerant of each other and also made it possible for Philadelphia industries to get much better service than they would get if the city was without a belt road. Plans are now complete for the extension of the belt tracks and the adoption of belt principles in connection with construction of other tracks by railroad companies. The presence of the belt, city officials say, was instrumental in bringing about latter. The belt line serves as the chief means of interchange between two of the city's three trunk lines. The city advertises the belt railroad as one of its best advantages.

Other Methods of Interchange. — Each of the three trunk lines handles its own freight inbound and outbound from its own freight stations and delivery yards to and from sidings of industries with which it has connections and does some of its own interchanging. One of the roads does all of its own interchanging. There is an extensive car float and lighterage service at this port, railroads owning their own equipment.

Interchange Charge. — The interchange charge over the belt is between $2 and $4 a car for two-way car movement. Roads absorb charge and thus there is no charge to shipper or consignee.

Proposed Improvements. — As a result of conferences extending over many months between the city of Philadelphia and the railroads, there is to be expended between $20,000,000 and $25,000,000 for improvement of the city's terminals. This project includes the moving of the big railroad water-front terminals in South Philadelphia to points further from the city, the taking of present piers by the city, and the construction of 10 more big municipal piers 900 to 1,200 feet long and 200 to 300 feet wide, the construction of a number of new streets, the widening and lengthening of a big municipal street, the building of a number of new railroad piers, the abolition of grade crossings, the elimination of cross-town freight tracks, and the construction of two great railroad yards to have a joint capacity of about 75,000 cars. New piers to be constructed will have a total area,

it is estimated, in excess of 6,000,000 square feet; the length of berthing space will be more than 40,000 linear feet for deep draught steamers.

Notes. — The water front is under the jurisdiction of the Board of Commissioners of Navigation for River Delaware and its navigable tributaries, and the Department of Wharves, Docks and Ferries, the former a State board, the latter a municipal department. The mayor appoints the majority of Commissioners of Navigation and the head of the Department of Wharves, Docks and Ferries, who is known as the Director. The Director of the Department of Wharves, Docks and Ferries has large executive powers, and has authority to condemn and approve wharf property. The Commissioners of Navigation have jurisdiction over all of the wharf property in the Delaware River and its navigable tributaries. The Department of Wharves, Docks and Ferries has care of the city's piers and the supervision of the construction of new piers. It maintains a municipal dredging plant and ice-boat fleet. Its expenditures in 1914 amounted to $813,442.80, while it placed contracts for $593,084.39 additional. The running expenditures of the department amount to $300,000 annually. City officials say that with contemplated improvements under way, annual expenditures of the department will amount to $500,000. Funds amounting to $1,919,979.75 in addition to the amount expended in 1914 were available for department work last year. The city has recently expended $7,000,000 on new piers; it has just completed three good-sized piers, two 180 feet wide by 550 feet long and the third 555 feet long and 125 feet wide. The first two are twin piers of concrete and steel and will cost $1,850,000, of which $513,000 was for site. During the beginning of the present city administration, the railroads owned 60 per cent. of the active water front and the city about 10 per cent. The city's holdings were available only for small wharves and industrial sites. Of the five good-sized piers, but one was used by ocean steamships, the others by river, bay and coastwise steamers. The city now owns all the best piers.

It is pointed out in pamphlets booming Philadelphia that that city does not use car floats or lighters as extensively as New York and that its water front is not clogged up like that of New York as a result. Officials of commercial organizations take pains to point out that this system of interchange of freight is not absolutely necessary in Philadelphia.

Municipal Piers Nos. 38 and 40, from Delaware Avenue, Philadelphia.

Municipal Piers Nos. 38 and 40 at Philadelphia.

Portland, Ore.

Population, 1910, 207,214.

Belt Line. — No.

While there is no belt line actually in operation, the foundation for such a road has been laid by the Commission of Public Docks. A provision has been incorporated in all franchises for the construction of new rail facilities within the city limits, providing for the common use of such tracks by all railroads and by the city. Portland officials say that it is expected that in the immediate future, possibly not more than a year or two, a municipal railroad will be in operation on both sides of the river, connecting the municipal docks.

Other Methods of Interchange. — Railroads all have their own freight terminals. In addition, there is a terminal company known as the Northern Pacific Terminal Company which is owned jointly by the Southern Pacific, Union Pacific and Northern Pacific. This is located entirely on the west side of the Willamette River, occupying a somewhat restricted district and serving a few industries with spur tracks. This company switches cars to and from this district.

Interchange Charge. — Freight is freely interchanged between the various railroads. Switching rates are absorbed by the company having the line haul and vary from $2 to $15 per car. Freight as a rule is delivered within 24 hours after it reaches the terminal yards.

Proposed Improvements. — Some consideration has been given to an enlargement of the Northern Pacific Terminal Company to take in the lines of all of the carriers on the west side of the Willamette River, but plans have not yet been consummated.

A comprehensive plan for the future development of the port of Portland has been prepared by the Commission of Public Docks. This provides for the construction of piers, quays and warehouses on property known as "Bridgeport" and "Mock's Bottom." It is estimated that it will require $14,475,000 to carry out these plans, and that, when completed, berthing space for 38 vessels of 500 feet in length with classification, assembling, and storage railroad yards accommodating 780 cars will be provided. The plan includes provision for industrial sections in the rear of the warehouses.

Notes. — Portland is divided into two sections by the Willamette River. The main business district is on the west side, as are

the principal industries and railroad terminals, both passenger and freight. On the east side are most of the wharves and warehouses for deep-sea vessels and large lumber plants, grain elevators and docks, flour mills, etc.

The total water frontage is about 24 miles, of which about 18 miles are available for deep-sea shipping.

The city voted a bond issue of $2,500,000 in 1912 for the improvement of the water front. It owns and operates three good-sized municipal docks and also a portion of the Public Levee.

Two commissions have to do with the port facilities of this port. In 1891 the "Port of Portland" was created to improve the Willamette and Columbia rivers between Portland and the sea and to create a proper ship channel, to construct and operate a dry dock, and to furnish coal and supplies to ships, etc. This is chiefly a channel improvement body.

A municipal board known as the Commission of Public Docks, which is comprised of five members appointed by the mayor, has jurisdiction between the pierhead and bulkhead lines, and has the control of the character of all structures built within that area. The ship channel from Portland to the sea has cost thus far $7,000,000, of which the port of Portland has expended $4,000,000 and the Government $3,000,000. The Government has also expended $12,500,000 to improve the mouth of the Columbia River.

The Commission of Public Docks has expended to date for the construction of piers and docks and for the purchase of the sites of the same, $2,400,000.

In the port of Portland is a floating dry dock, five pontoons, with a capacity of 10,000 tons; another dry dock at this port is owned by the Oregon Dry Dock Company. This dock has a capacity of 3,500 tons.

Richmond, Va.

Population, 1910, 127,628.

Belt Line. — No.

The Traffic Manager of the Chamber of Commerce states that he favors belt line made up from existing interchange tracks and other tracks constructed to round out such line. He believes that it would do very much to eliminate the delay in transferring cars to and from private or assigned sidings.

Other Methods of Interchange. — Freight is interchanged between various railways over interchange tracks laid in the

past, as occasion seemed to require. The expense of the interchange service is defrayed by the carriers.

Interchange Charge. — No information.

Proposed Improvements. — Within the past few years the freight conditions and terminals of various lines, with the exception of one, have been modernized. Chamber of Commerce representative states that he expects modernization of other terminal very soon.

Rochester, N. Y.

Population, 1910, 218,149.

Belt Line. — No.

Other Methods of Interchange. — The five roads entering Rochester do their own switching. Through freight is interchanged at a point called Genesee Junction some six miles out of the city. A representative of the Rochester Chamber of Commerce states that it is understood that interchange runs up to 400 or 500 cars per day. The interchange in the city to and from city points amounts to between 100 and 200 cars a day. Of the five roads entering Rochester, the Lehigh Valley road is not connected by rail with any other road in Rochester.

The Erie Railroad switches to the Pennsylvania, and its cars for the New York Central Railroad are switched to the latter road via the Pennsylvania rails. The Buffalo, Rochester & Pittsburgh Railway and the Pennsylvania and the New York Central railways have local interchange tracks for switching purposes.

Interchange Charge. — The railroad companies stand the cost of switching on all cars where the through revenue amounts to $20 or more.

Proposed Improvements. — There has been some consideration given to a project for utilizing the old canal bed for connecting certain lines when it is available. This matter has not taken any definite shape as yet.

St. Joseph, Mo.

Population, 1910, 77,403.

Belt Line. — Yes.

There is a railway known as the St. Joseph Belt Railway and there are two other railways known as the St. Joseph Terminal Railroad and the Union Terminal Railway of St. Joseph.

Other Methods of Interchange. — All the railroads do interchanging. In the case of L.C.L. traffic, freight is more generally transferred by trucks or teams from station to station.

Interchange Charge. — Interchange of through traffic, which is done freely by all carriers, is without cost to shippers or consignees. In case of traffic destined to or originating at St. Joseph, it is a general practice for the railroads enjoying the line haul to pick up and deliver such traffic at all industries on their own lines, without additional charge. Where the freight originates or terminates on terminals of other lines, the line enjoying the line haul absorbs the switching charge. There are exceptions to this practice where the revenues are insufficient to warrant the absorption of the switching charge, but these are very few.

L.C.L. freight originating or terminating at St. Joseph is handled in "trap" or "ferry" cars. This is in cases of shipments where there is assembled a quantity of 6,000 pounds or more. Switching is performed on the same general rules as in carload traffic.

Proposed Improvements. — Plans have been presented for the improvement of the passenger terminal service. They contemplate the development of the property and more comprehensive plan of track adjustment and extension.

Notes. — A representative of the Commerce Club stated that speaking broadly the freight service given by the railroads is satisfactory, except in cases where freight has to be interchanged in connection with service to industries where at times there is serious delay in performing switching service. He states he believes this to be due to the two-line service involved, and perhaps to the lack of interest on the part of the company which does not enjoy the road haul revenue. He states that this is one of the conditions which business men feel could be greatly improved, if not entirely obviated, by securing more satisfactory interchange connections between the several carriers and by the more common use of the terminals as a whole.

St. Louis, Mo.

Population, 1910, 687,029.

Belt Line. — Yes.

Two belt lines for clearing freight business are operated by the Terminal Railroad Association of St. Louis. This is a regularly incorporated company doing a passenger and freight ter-

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minal business. Its stock is held by the fifteen companies which it serves. It has been in existence about thirty-five years. Its profits are put into equipment when receipts exceed expenses. Any deficit is supposed to be made up through future business, but in the event of its failure to do this, the understanding is that the deficit will be prorated among the owning companies. Business men assert that the association has earned a net surplus of $1,000,000 a year.

In addition there is an independent outer belt line around East St. Louis known as the Alton & Southern. This is partly in operation and is about to be extended northerly.

The city contemplates acquiring control of additional terminal properties which it is expected will ultimately give it control of the levee line about 20 miles long and possibly the belt connection southwest of the city.

The city operates an electric line about 7½ miles long extending northerly from the water works settling basins near the Merchants Bridge to the new intakes and filtration plant at the Chain of Rocks at the extreme north city limits. The city also is constructing and will have ready for operation about Oct. 1, 1916, a new municipal bridge across the Mississippi. The city line at the north end of the city is in operation by electric cars for the passenger service, and two steam locomotives for freight switching.

One of the belt lines operated by the Terminal Association is in St. Louis proper and the other in East St. Louis. Its officials told the Commission that from 75 per cent. to 80 per cent. of the freight business of St. Louis is handled by this association. Tracks of the Terminal Association belt lines extend 25 miles beyond the station. The association does an interchange business between all railroads and maintains warehouses for receipt and delivery of less than carload lots and terminals for the receipt and delivery of carloads. It also does an interchange business between various industries located along its tracks and those of the railroads. A ferry service between St. Louis and East St. Louis for the accommodation of passengers and for the transfer of freight is operated by this association. The association has three clearing yards on the east side of the river and four on the west side. The capacity of its yards on the west side is about 4,500 cars. It has a clearing yard at Granite City which has a capacity of 4,500 cars and which is used chiefly as an interchange yard between railroads and industries. The Terminal

C. R. I. & P. Ry. Co.
C. B. & Q. Ry. Co.
M. K. & T. Ry. Co.
Mo. Pac. Ry. Co.
St. L. I. M. & S. Ry. Co.
St. Louis & S. F. Ry. Co.
Wabash Ry. Co.

In addition the T. St. L. & W. and the C. P. & St. L. reach East St. Louis, as well as three short lines, the St. Louis, Troy & Eastern, the St. Louis & O'Fallon, and the East St. Louis & Suburban Electric Railway, running 20 to 30 miles out to the coal fields.

East St. Louis serves very largely as a freight clearing house for St. Louis.

In the early days before the bridges were constructed, C.L. freight was ferried across the river to and from East St. Louis and a river charge, or what is known as an "arbitrary" charge, was made for this service. Even after construction of the bridges, this "arbitrary" charge was assessed against all freight in addition to the through rate.

In 1905 an agreement was entered into whereby the railroads eliminated this charge on all St. Louis business originating and destined outside of the zone having a radius of one hundred miles around the city. The "arbitrary" charge, which is still levied against the freight within the hundred mile zone, has caused a great deal of dissatisfaction and is responsible for the decision of the city officials to construct the municipal bridge at a cost of $6,250,000. It is planned by the city officials to extend the use of the bridge on very low terms to any and all lines which will agree to make deliveries at the same rates on both sides of the river, wiping out the so-called "arbitrary"; and in order to encourage East St. Louis lines to make deliveries in St. Louis without the "arbitrary" charge, the city contemplates acquiring control of sufficient terminal properties for the use of such lines.

One of the features of the St. Louis terminal facilities is a great business terminal located in the heart of the city, known as the Cupples Station. This station is comprised of a series of big buildings which cover a ground space of about 500,000 square feet. The station is occupied by a number of concerns, wholesalers, jobbers, etc., who occupy separate warehouses, offices, etc., just as they would if located in separate buildings of their

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own. The station is conducted by the management just as is a great freight terminal, spur tracks running into it to connect with all the railroads entering the city. The management takes freight to and from the shipping room doors of its various tenants, loads it on or unloads it from the railroad freight cars, saving the tenants of the station the expense of teaming and time consumed by rehandling and carting freight under the teaming system. The expense of handling freight is not charged to the tenants of the station directly.

Some of the railroads absorb the charges which include the loading and unloading and delivery by hand truck at a cost of about 33 cents a ton, while other railroads have recently included the absorption in tariffs now pending before the Interstate Commerce Commission, although business interests in other parts of the city have filed petitions with the Commission on the ground that it constitutes backdoor delivery of freight ot the tenants in the Cupples Station buildings, a service that is denied similar business houses located elsewhere and must be paid for by the latter.

The tenants of the Cupples Station pay in rent for the unusual facilities of freight shipment offered them. This rental is charged on a tonnage basis. There can be loaded at one time in the station 66 freight cars. Originally the Cupples Station was started as a real estate proposition. It has since, however, become an endowment with Washington University as a beneficiary, and is operated under the direction of the trustees of that university.

St. Paul, Minn.

Population, 1910, 214,744.

Belt Line. — No.

Other Methods of Interchange. — Each railroad has its own facilities for handling all carload and less than carload freight, but practically all C.L. and L.C.L. freight moving through this gateway is interchanged at Minnesota transfer which is located midway between the cities of St. Paul and Minneapolis.

Proposed Improvements. — None immediately.

Notes. — St. Paul Association of Commerce says that there is no congestion such as might be expected in the larger cities.

(See Description of Minnesota Transfer and Hamline Transfer, following immediately after abstract conditions in cities of United States.)

San Antonio, Tex.

Population, 1910, 96,614.

Belt Line. — No.

Other Methods of Interchange. — Each of the railroads maintains and operates its own interchange facilities. Each line assembles all cars that it may have for all other lines and at a stated time of the day, usually in the afternoon, deliveries for each line are made on the transfer track of the respective roads, and all cars which were on the transfer tracks of the line making the deliveries are pulled in at the same time. The average number of cars handled daily approximates 2,000.

Interchange Charge. — On interstate business there is no switching charge excepting in cases where the net revenue left, after paying connecting lines for services for switching is less than $7.50 per car. The difference is charged against the cargo on interstate business. The line enjoying the road haul absorbs the switching charges on competitive traffic. The interstate traffic that is not competitive is so small as to be negligible.

Proposed Improvements. — Plans are in process whereby the freight terminals of the International & Great Northern Railroad will be removed well outside the city limits, thus making available for additional track facilities the present ground in the city, now occupied by these terminals.

The Missouri, Kansas & Texas Railway is planning very extensive terminals of its own. It is now using the terminal facilities of the Southern Pacific with the latter road.

San Francisco, Cal.

Population, 1910, 416,912.

Belt Line. — Yes.

The public belt railroad is owned and operated by the State, under the jurisdiction of the Board of Harbor Commissioners. Belt railway performs switching and local interchange service and furnishes connections in conjunction with all railroad lines and with many of the piers, wharves and docks of the city. This railway does all the switching in the northerly section of the city and that territory which is immediately beyond, connecting with and serving many industries. It is operated in two divisions, — one north and the other south of Market Street, — and connects with all four of the transcontinental roads entering the city, its spur tracks running to the outermost ends of nearly all of the

piers. The belt main line is 6.7 miles long. The spur tracks bring the total mileage of the road up to 19.1 miles. The approximate cost of the belt to date is $879,228.

Seven locomotives are employed by the belt line, which maintains its own machine shop, round house, and track-laying and repair force.

Other Methods of Interchange. — Considerable of the transfer service is by car float and barges, the railroads for the most part operating their own car float and barge service.

Interchange Charge. — The belt road charges for car movements within each division $2.50 per car, and for movements from one division to another, $5 per car. Harbor Board officials say that by this interdivision shippers are enabled to send a carload from one end of the water front to the other for $5, whereas the railroads formerly performed this service and charged from $11 to $15 per car. For car movements through the Fort Mason tunnel (toll in addition to switching rates) a charge is made of $10 per car. On through freight all railroads absorb the switching charges. Switching charges are not assessed against any industry on any line where business involves a competitive haul. Where a freight movement occurs between an industry on one line and an exclusive point on a competitive line, the industry pays $2.50 per car for switching. The railroads absorb all switching charges between points on their own lines. The belt road pays its way, the San Francisco officials say.

Proposed Improvements. — The Board of Harbor Commissioners contemplates the gradual extension of the belt line in order to broaden the field of service of the line and to comply with the demands of service that are being made. Extensive additions and improvements are being made in the wharf and dock facilities of this port.

Notes. — The State of California owns and, through a State Board of Harbor Commissioners appointed by the Governor, operates the entire water front of San Francisco, which is the largest and most important port on the Pacific coast. This Board is comprised of three members who are appointed by the Governor for terms of four years. The president of the Board receives $5,000 a year and the other two members $3,000. The Board has broad powers. It is authorized to construct, repair, lease and regulate the use of these piers, docks, sea walls, etc., to operate the belt road, and in general to supervise and control the whole San Francisco harbor front. This Board was first

appointed in 1863. According to the reports of the Commissioners, the harbor has always been self-supporting; the revenues derived from charges imposed upon shipping and cargoes in the form of rents and tolls, dockage and wharfage for the use of the wharves, switching charges of the belt railroad, and charges for the privileges of the sea-wall lots, the ferry and other buildings, and for use of the ferry slips, etc., being sufficient to meet the running expenses of the Harbor Commission and pay off the principal and the interest on bond issues.

The money to defray the initial expenses of the larger improvements is raised by bond issues authorized by the people at general elections. The State lends its credit for the issuance of these bonds. A $9,000,000 bond issue authorized in 1910 is now nearly exhausted and work will soon begin under a bond issue of $10,000,000 authorized at the general election in November, 1914.

The Board of Harbor Commissioners states that $51,084,906.99 has been expended in San Francisco harbor improvements to date. It is stated in reports of the Harbor Commissioners that not one dollar of the money expended in the improvements of San Francisco's harbor front has been paid by the people of California in the way of taxes.

The San Francisco Harbor Commissioners assert that "if the present San Francisco harbor front and facilities were owned and operated by private interests, they would be capitalized at least for the sum of $250,000,000 and handsome returns could easily be made on that figure."

Under the law the Harbor Board can charge in rentals, wharfage, etc., only sufficient to cover the expenses of this department.

The water-front line of San Francisco in active use is approximately four miles in length. There are 32 piers (also 2 under construction) and 27 sea-wall lots of land, under the direction of the Harbor Commission. Within the past two years, there have been constructed at San Francisco 7 large piers. Four of these are 200 feet wide and are 981, 945, 896 and 800 feet long respectively. Provision has been made to extend these piers to 1,100 feet when necessary.

About 9 miles of berthing space was afforded by the piers and bulkhead wharves on June 30, 1914, the date of the last report of the Commission. Since then, however, 7 new piers from 685 to 981 feet long have been completed.

Scranton, Pa.

Population, 1910, 129,867.

Belt Line. — No.

Other Methods of Interchange. — Railroads do their own interchanging on common interchange tracks. There are several interchange points.

Interchange Charge. — The roads absorb switching charges on the carload shipments to and from Scranton where the rates from point of origin to point of destination equal or exceed the following: —

	Per Ton.
1 to 50 miles, inclusive,	$1 00
51 to 100 miles, inclusive,	1 20
101 to 150 miles, inclusive,	1 40
151 to 200 miles, inclusive,	1 60
201 to 250 miles, inclusive,	1 70
251 to 300 miles, inclusive,	1 85
Over 300 miles,	2 00

In this way the flat Scranton rate is given to all firms and industries in Scranton, South Scranton, Green Ridge and Dunmore, with very few exceptions where the rate does not exceed $1.50 per ton.

Proposed Improvements. — No information.

Seattle, Wash.

Population, 1910, 237,194.

Belt Line. — No.

The Port Commission of the port district has taken steps to begin the construction of the first unit of a belt line which it is proposed to run along the water front of the city. The Commission first tried to induce the railroad companies to construct belt by building links to connect railroads; on the failure of the latter to agree to do this, the decision was made to build a public belt.

Other Methods of Interchange. — All carriers interchange with each other, the total number of freight cars interchanged in a day being about 2,300. The Northern Pacific Railway, the earliest road which reached the city and which dominates the central water front, does the larger part of the switching service, though the other three transcontinental lines also operate switching cars and receive and deliver cars from definite transfer points.

Interchange Charge. — The cost of interchange of cars varies from $1.50 to $12.50 depending upon the distance of the haul, there being on the Northern Pacific 12 distinct switching zones. It is about 15 miles between the most distant switching points. These switching charges are absorbed by each road should the shipment originate at a competitive point; otherwise they are paid by the shipper.

Proposed Improvements. — The Port Commission plans to follow a broad scheme for the development of the vacant water front in connection with the construction of the proposed public belt railroad above outlined.

Notes. — The port of Seattle District, which is coterminous with King County, was created by a vote of the people of that county at a special election held Sept. 5, 1911, under the authority of the State Legislature. The port affairs are administered by a port municipal corporation superimposed on the city of Seattle and the County of King, but independent of both city and county. It is the only port organization of its kind in the United States. The governing body of the port district is known as the Port Commission and consists of three members elected by the vote of the entire county for terms of three years, so arranged that one commissioner retires every year. Commissioners are obliged to serve without compensation. The Port Commission is charged with the work of administering and developing the port of Seattle. It acquires water-front property, builds wharves and terminals and leases same to private parties. Under the law it has the power to levy a direct tax on the property of the district, not exceeding 2 mills in any one year. It can issue bonds on the credit of the port district not to exceed 3 per cent. of the assessed valuation.

To date $6,300,000 has been appropriated to be expended under the direction of the Port Commission for terminal improvements. This money is raised by the sale of port district bonds. Approximately $5,000,000 has been expended, including $1,500,000 for water-front sites. The Commission has constructed 13 terminal units, which has included a number of docks, wharves and warehouses.

The city of Seattle has grown very rapidly in the decade 1900–10, the population increasing from 80,000 to 237,000. It is believed to be now the home of approximately 300,000 people.

The city is served by four transcontinental railway lines entering the city on their own rails; four entering on the rails of

other transcontinental lines; and two entering the city by water. The roads entering on their own rails are the Great Northern, the Northern Pacific, Chicago, Milwaukee & St. Paul and the Union Pacific-Oregon-Washington Railroad Navigation Company. The Chicago, Burlington & Quincy and Canadian-Pacific operate trains over the Northern Pacific Railway's tracks, while the Chicago & Northwestern and Southern Pacific have passenger service over the Northern Pacific and Oregon-Washington Navigation Company, respectively.

Sioux City, Ia.

Population, 1910, 47,828.

Belt Line. — No.

The Sioux City Terminal Railway Company, while it is not exactly a belt line, operates a road which connects with all six of the trunk lines entering Sioux City. This road does not interchange cars between railroads, but handles cars between the railroads and the stock yards, packing houses and other industries.

Other Methods of Interchange. — The trunk lines do all of their own interchanging.

Interchange Charge. — The Sioux City Terminal Railway Company charges $1.50 per car for switching cars between railroads and industries and charges $1.50 per car for moving live-stock cars between points on its own road, and $1 per car for moving cars containing other commodities between such points.

Notes. — According to officials of this road, without terminal railway connections it would have been impossible to have developed the business at Sioux City to such an extent as it has been developed.

Spokane, Wash.

Population, 1910, 104,402.

Belt Line. — No.

Other Methods of Interchange. — Each road at Spokane has a direct physical connection with every other road known as a transfer track. Cars are put on the transfer tracks for delivery to industries located in the different yards and destined to points on connecting lines beyond Spokane. The line to which these cars are destined at certain stated times through the day pulls these cars off the transfer track. Average number of freight cars handled per day is 146 loaded.

Interchange Charge. — For purely switch movement from one point in yard to another, 3 cents per hundredweight, minimum $7.50 per car, is charged. On cars received by connecting lines for switching to warehouses, the charge is 2 cents per hundredweight, minimum $7.50, when switching line could have performed road haul and $3 per car when from local point on connecting line.

The first charge is absorbed by connecting line, the second paid by consignee. No road accepts connecting line cars for team track delivery, only for delivery to occupants of warehouses adjacent to the yards.

Proposed Improvements. — None.

Syracuse, N. Y.

Population, 1910, 137,249.

Belt Line. — No.

Other Methods of Interchange. — The railroads do their own transferring. The New York Central lines have classification yards at Dewitt, seven miles from Syracuse. This is one of the largest yards in the United States. Through C.L. freight is sent around the city, while L.C.L. is forwarded through terminals in the city.

The road has three freight transfer houses. Local freight is handled direct to city houses.

The Delaware, Lackawanna & Western has two freight houses, one inbound and one transfer and outbound house. The inbound house is modern. C.L. and L.C.L. freight is handled in yards in the city.

Interchange Charge. — The New York Central and Delaware, Lackawanna & Western interchange on switching absorption basis. The line that enjoys the road haul absorbs the switching, *i.e.*, on traffic originating on private industry on New York Central lines switched to Delaware, Lackawanna & Western for movement from Syracuse via Delaware, Lackawanna & Western, switching is absorbed by the latter road. L.C.L. and through traffic is handled on basis of through rate. This absorption of switching charges is true only when revenue is sufficient. The minimum revenue per car is approximately $13 or $14.

Proposed Improvements. — Freight yards, extensions around the barge canal harbor and a bridge, which will cost between $1,000,000 and $2,000,000, are planned by the railroads.

Tacoma, Wash.

Population, 1910, 83,743.

Belt Line. — No.

Other Methods of Interchange. — The railroads all do their own interchanging.

Interchange Charge. — No information. The railroads absorb wharfage, storage, loading and unloading charges on traffic covered by joint through tariff in connection with vessels for transportation by water and on trans-Pacific traffic interchanged between the Northern Pacific Railway or the Chicago, Milwaukee & St. Paul Railway and a number of specified steamship lines.

Proposed Improvements. — The city has extensive plans for the development of the water front. These plans include a canal system which is called the "Wapato-Hylebos Waterway." This will have a length of six miles with spurs and laterals which it is planned to build in connection with large industries. This canal is to cost $4,000,000. It will develop a large area of tide flats and afford an opportunity for industrial development.

Notes. — Tacoma is situated on the southern and southwestern shores of Commencement Bay, an arm of Puget Sound, about 30 miles south of Seattle. The harbor is 2½ miles long and has an average width of nearly 2 miles. It is very deep and is navigable by the largest ocean liners. The principal water front is on the southwestern shore of the bay. At the southern end there are extensive tidal flats on which a number of waterways have been constructed. According to Chamber of Commerce letter, it has been estimated that 22.1 miles of water front are available at the port of Tacoma, not including 4.2 miles which are outside the limits of the city. The city owns nearly 4 miles in addition to the street ends on the water front. The remainder of the frontage is owned by the several railroad companies, manufacturing establishments and private individuals. Not more than one-third of the frontage has been developed for private commercial purposes.

The improved frontage lies on the west side of the bay and along the City Waterway, Middle Waterway, Puyallup Waterway, and the slip excavated by the Chicago, Milwaukee & St. Paul Railway Company. Two modern docks, known as the "Municipal" and "City" Docks, are owned by the city of Tacoma. The former is 500 feet long and 170 feet wide, while the latter is 300 feet long and 175 feet wide. The Municipal Dock is used chiefly

for passenger and express freight traffic. This dock, however, does not handle ocean freight. The City Dock is used principally by fishing boats and other small vessels. A third wharf, known as the McCarver Street Wharf, which is 100 feet long and 300 feet wide, is also owned by the city.

The city owns and leases to industrial firms, 800 feet of land fronting on the City Waterway and 300 feet on Middle Waterway.

Four great transcontinental railroads serve Tacoma, — the Northern Pacific, the Chicago, Milwaukee & St. Paul, the Great Northern and the Oregon-Washington Railroad and Navigation Company. All have their own terminals.

The control of the port of Tacoma lies in the municipality. The Department of Public Works is charged with the construction, maintenance and operation of the municipal docks, while the Harbor Master, an official of the Department of Public Affairs, is charged with the enforcement of harbor regulations. A superintendent of docks is in immediate charge of the municipal docks. This official is an appointee of the Commissioner of Public Works.

Harbor improvement and dock construction funds are provided by issues of bonds and by appropriations from the city treasury made by the City Council.

A sinking fund is maintained from the net income from the municipal docks for the purpose of retiring harbor improvement bonds.

Tacoma is authorized by law to purchase water-front terminal property and to operate the terminal facilities, including railroads. No dockage charge is assessed against vessels using railroad terminals. The city, however, makes a wharfage charge for all freight passing over the municipal wharves, except stores for ships which use these wharves. The prevailing wharfage rate is 25 cents a net ton or 40 cubic feet. This is the rate on flour, grain, feed, hay, vegetables, fruit, dressed meats, poultry, tiles, box shocks, crates and a number of other articles. Charges on lumber and timber products are as follows: lumber per 1,000 feet, 25 cents; laths per 1,000, 10 cents; green shingles per 1,000, 15 cents; and kiln dried shingles per 1,000, 10 cents.

Toledo, O.

Population, 1910, 168,497.

Belt Line. — Yes.

The belt line railroad which encircles the city comes in contact with each of the other Toledo railroads. It has 31.5 miles of main line, 5.5 miles of second main track, and with spur tracks has a total mileage of 66 miles. It is operated by a Terminal Company. There is some interchange traffic between Toledo trunk line roads through the medium of this belt line, but generally the belt line does not perform the terminal services or furnish the terminal facilities for the railroads. It serves a number of industries located on its lines.

Other Methods of Interchange. — Each railroad operates its own terminals, and does most of its own interchanging.

Interchange Charge. — The belt railroad is paid $2.50 per loaded car and $1.50 per empty car for interchange service between railroads. Railroads absorb interchange charges as a general thing, the line with the road haul standing the expense. For L.C.L. freight each carrier operates its warehouse or freight station either by dray or through trap or ferry cars. This service is performed without additional switching charge except where such service encounters the switching of an intermediate or connecting line. In that case the switching charge is paid by the owner of the freight.

Proposed Improvements. — No information.

Washington, D. C.

Population, 1910, 331,069.

Belt Line. — No.

Other Methods of Interchange. — Railroads do their own interchanging. Southern lines interchange at large transfer station at point 4 miles south of Washington, known as Potomac Transfer, Va., where there are facilities for handling many cars. This is also the point of interchange between the southern lines and the Pennsylvania Railroad and Baltimore & Ohio. The Baltimore & Ohio cars are moved over the Pennsylvania Railroad tracks out to Benning and then back over the Baltimore & Ohio tracks into Washington. Potomac Transfer is operated by the Washington & Southern Railway. It is used to a great extent to divert carloads of freight from the south to various points in the east and north.

There is some interchanging done between the railroads and the steamboat companies. The Philadelphia, Baltimore & Washington Terminal Company handles freight going into Washington and does freight handling for the Pennsylvania Railroad, Chesapeake & Ohio, Philadelphia & Reading and the Washington & Southern Railway.

Interchange Charge. — Cost of interchange between railroads is in accordance with regular published tariff rates, one hundred pounds or per ton.

Notes. — Washington has a splendid union terminal which is used by the big trunk lines entering the city. The board of managers, composed of representatives of the owning and tenant companies, is at the head of the operating organization. The owning and tenant companies are as follows: Pennsylvania Railroad, Baltimore & Ohio, Washington & Southern, Chesapeake & Ohio and Southern, — five members in all.

Wheeling, W. Va.

Population, 1910, 41,641.

Belt Line. — Yes.

The belt line is operated by the Wheeling Terminal Railway Company, which is privately owned.

The line extends from Martins Ferry, Ohio, to Benwood, W. Va., a distance of about ten miles. It connects with the B. & O. main line, B. & O. R.R., Ohio River Division and P. C. C. & St. L. Ry. in Wheeling and with the Pennsylvania Co., W. & L. E. R.R. and B. & O. R.R., C. L. & W. Division, Martins Ferry, Ohio, besides tapping the chief industrial plants of Martins Ferry, Wheeling and Benwood.

It also affords terminal facilities at Wheeling and Benwood for the Pennsylvania Company and W. & L. E. R.R. Co.

The company operates a local freight service, intermediate service, reciprocal switching and terminal facilities for the Wheeling & Lake Erie Railroad, and Pennsylvania Company in Wheeling and Benwood, W. Va. In the Wheeling territory this company does approximately 40 to 45 per cent. of the interchange service.

Other Methods of Interchange. — The trunk lines do considerable of their own interchanging.

Interchange Charge. — The average charge for interchange service is as follows: reciprocal switching for lines on either side of river, but not crossing river, $3 per car; for intermediate

switching when crossing the river, from 15 to 20 cents per ton; for terminal service charges, varying from 15 to 30 cents per ton according to commodity.

The railroads absorb the interchange charge.

Notes. — According to officials of the company, the belt road has benefited the railroads by supplying terminal facilities which they otherwise would not have had, by opening up the territory for industries, and by providing shipping facilities which perhaps otherwise would not exist.

The original cost of construction of the Wheeling Bridge & Terminal Railroad was between $5,000,000 and $6,000,000. The construction of a bridge across the Ohio River, the construction of three tunnels with an aggregate length of about 4,500 feet, and a number of smaller bridges brought this cost up materially. In addition to this, the line was located exclusively within the corporate limits and the cost of property was very high, as was also the cost of construction owing to the topography of the ground over which the line was built. Also all the bridges and tunnels were constructed for double track.

The gross earnings of the Wheeling Terminal Railway Company amounted in 1892 to $46,902.38 and in 1914 to $199,317.25.

Wilmington, Del.

Population, 1910, 87,411.

Belt Line. — No.

Other Methods of Interchange. — The railroads do their own interchanging. The Pennsylvania Railroad has a freight transfer located on the edge of the city.

Interchange Charge. — For switching service a flat charge of $2.10 per car is made. This charge is paid by consignee or shipper.

Proposed Improvements. — None.

MINNESOTA TRANSFER OF THE MINNESOTA TRANSFER RAILWAY COMPANY, ST. PAUL, MINN.[1]

The Minnesota Transfer Railway Company was incorporated March 22, 1883, under the laws of the State of Minnesota. The company is authorized to facilitate the transfer of freight, between the owners, at the Minnesota Transfer.

The authorized capital stock is 3,000 shares, of which seven hundred shares have been issued. Each of the following ten companies holds seventy shares of stock: —

Chicago, Burlington & Quincy Railroad.
Chicago, Great Western Railroad.
Chicago, Milwaukee & St. Paul Railway.
Chicago, Rock Island & Pacific Railway.
Chicago, St. Paul, Minneapolis & Omaha Railway.
Great Northern Railway.
Minneapolis, St. Paul & Sault Ste. Marie Railway.
Minneapolis & St. Louis Railroad.
Northern Pacific Railway.
Minnesota Transfer Railway.

The funded debt consists of —

First mortgage bonds, 5 per cent.,	$904,000
First mortgage bonds, 4 per cent.,	1,149,000
Total,	$2,053,000

These bonds are dated Aug. 1, 1886, and mature Aug. 1, 1916. Interest is payable February 1 and August 1. The Northeastern Trust Company of St. Paul is trustee.

Interest on these bonds — after deducting therefrom the revenue from the stock yards — is paid by the proprietary companies on a basis of stock ownership.

The operating expenses are paid by the participating companies, prorated on a tonnage basis. A new system for dividing this expense is now under consideration and will be described later.

The transfer yard of the Minnesota Transfer Railway is located about midway between St. Paul and Minneapolis, and

[1] Description sent to the Terminal Commission by courtesy of Mr. Edward J. Noonan, Secretary, Chicago Railway Terminal Commission, February, 1915.

occupies an area of approximately 206 acres. The investment in land represents about $6,000 per acre, or a total of $1,236,000. This figure is about one-half of the present value of adjacent property.

The transfer yard is composed of seven separate yards, as follows: —

Classification yard.
Pick-up and set-out yard for west-bound trains.
Pick-up yard for east-bound trains.
Set-out yard for east-bound trains.
Transfer yard.
Storage yard.
Repair yard.

There are approximately 104 miles of track within the limits of these yards.

The Transfer Railway serves 120 industries in the vicinity of their yards, handling both carload and L.C.L. freight to and from the industry tracks without switching charge.

Two local freight receiving stations are maintained by the Transfer Railway, near their yards. Freight is received from teams at these stations and transferred through the yards to the various connecting lines.

The business of the Transfer Railway is divided into several classes but consists chiefly of the transfer — or interchange — of through freight. The local or city freight handled by the transfer is a comparatively small item, and consists only of freight from industry tracks and from the two receiving stations before mentioned.

Figures for the year ended Aug. 31, 1914, showing the tonnage, cost per ton and total cost of handling the various classes of freight, follow.

In compiling these figures, the actual number of tons handled has been used, instead of counting interchange freight twice,— into the yard from the original road and from the yard to the receiving road. In prorating the expense of handling this class of freight, it is necessary to include this tonnage twice, but for purposes of comparison, this plan cannot be used.

Tonnage handled and Cost per Ton, Year ended Aug. 31, 1914.

Class of Freight.	Number of Tons.	Cost per Ton.	Total Cost.
No. 1. L.C.L. through freight, transferred at platform,	126,104	$1.39600	$176,046 48
No. 2. L.C.L. city freight from receiving stations, transferred at platform.	18,513	.98990	18,326 35
No. 3. L.C.L. city freight from industry tracks, transferred at platform.	3,257	.52159	1,698 82
No. 4. Interchange through unbroken bulk freight (L.C.L. in carload).	106,688	.90847	96,922 80
No. 5. City freight from receiving stations, not transferred at platform.	26,660	.43714	11,654 21
No. 6. City freight from industries, not transferred at platform.	32,904	.28762	9,464 00
No. 7. Interchange straight carload freight, . .	3,586,784	.03897	139,784 69
No. 8. City carload freight from industries, . .	1,143,640	.07463	85,357 88
No. 9. Twin City Stock Yards straight carload freight,	27,061	.12400	3,355 74

Total tonnage handled, 5,071,613.

From the foregoing figures it will be noted that the total L.C.L. freight transferred during the year was 147,874 tons, or a daily average of 472 tons. This is but 2.91 per cent. of the total freight handled at the transfer.

Of the L.C.L. freight transferred, 85 per cent. was through—interchange—freight, and 15 per cent. was city freight.

Carload interchange freight comprises the bulk of the business handled by the transfer, and averages 11,800 tons daily. This is 72.8 per cent. of the total tonnage.

The total amount of interchange freight — carload and L.C.L. — handled at the transfer, for the year, was 3,819,576 tons, or 75 per cent. of the total business. In addition to this were 936,118 tons of carload freight interchanged direct between the several railroads, which did not pass through the transfer yard. This makes a total of 4,755,694 tons of interchange freight for the year, 80.3 per cent. of which was handled through the transfer.

The costs opposite the various items above represent the total cost of handling the several classes of freight, and will be taken up in detail later. There are, however, several additional services performed at the transfer in connection with the handling of freight, but which are not directly chargeable to any of the individual classifications shown above.

These services have, therefore, been shown separately, with their respective costs for the year ended Aug. 31, 1914, on the following page: —

Services Performed.

Kind of Service.	Number of Tons.	Cost per Ton.	Total Cost.
No. 10. Through carload interchange, transferred by hand.	378,132	$0.23556	$89,074 66
No. 11. Through carload interchange, transferred by derrick.	61,399	.09706	5,959 51
No. 12. Cars unloaded and loaded in shingle yard, .	14,576	.22810	3,324 84

Kind of Service.	Number of Cars.	Cost per Car.	Total Cost.
No. 13. Interchange of empty cars, ...	197,063	$0.35540	$70,042 69
No. 14. Extra movements of bad order cars, . .	55,450	.94780	52,556 79
No. 15. Extra movements of hold cars, ...	18,616	.71086	13,233 50
No. 16. Extra movement cars to and from local stock yards.	7,163	.71086	5,091 94
No. 17. Extra movement cars placed at ice house, .	3,074	.71086	2,185 21

Items Nos. 10 and 11 constitute carload through freight transferred at the yard. The transfer of these cars is necessitated either because of the cars being in bad order when received or on account of the original road requesting return of the car in which the freight was received. This transfer is made on parallel tracks, by hand trucking from one car to the other, or, in the case of heavy freight, by the derrick. From 75 to 90 cars of this freight are transferred daily.

Item No. 14 includes movements of bad order cars to and from the repair tracks, within the transfer yards.

Item No. 15 covers the handling of "hold" cars to and from the storage yard. These are, in most cases, cars for which the billing is incorrect, and are held at the transfer until corrections are received.

The total cost of operation of the transfer for the year was $784,080.11. Revenues for the year — chiefly earnings from the shingle yard — total $21,340.24, making the net operating expenses $762,739.87. The total tonnage handled was 5,071,613, making the average net cost per ton 15.03 cents.

The actual cost of handling the various kinds of freight — shown on page 166 — varies from 3.89 cents to $1.396 per ton.

These costs are comprised of three items, — accounting, transportation and handling.

Figures showing these divisions of cost for the month of December, 1914, follow. The average cost per ton for this month was somewhat higher than for the year, owing to the small December business.

Freight Handling Costs, December, 1914.

Class of Freight.	Accounting.		Transportation.		Handling.		Total Cost per Ton.
	Cost per Ton.	Per Cent. of Total Cost.	Cost per Ton.	Per Cent. of Total Cost.	Cost per Ton.	Per Cent. of Total Cost.	
No. 1. L.C.L. through freight, transferred at platform.	$0.6884	47.1	$0.4421	30.2	$0.3310	22.7	$1.461
No. 2. L.C.L. from receiving station, transferred at platform.	.3873	32.9	.2144	18.2	.5761	48.9	1.178
No. 3. L.C.L. from industries, transferred at platform.	.2293	31.2	.1738	23.7	.3310	45.1	.734
No. 4. Interchange through unbroken bulk freight.	1.1296	89.1	.1386	10.9	-	-	1.268
No. 5. From receiving stations, not transferred at platform.	.1180	22.4	.1624	31.0	.2450	46.6	.525
No. 6. From industries, not transferred at platform.	.1325	44.0	.1687	56.0	-	-	.301
No. 7. Interchange straight carload freight.	.0066	15.7	.0352	84.3	-	-	.042
No. 8. Carload freight from industries.	.0031	5.3	.0557	94.7	-	-	.058

The cost of accounting, per ton, which includes all office and clerical work — consisting chiefly of the billing or rebilling of freight — is governed almost entirely by the weight of the individual shipments. For instance, accounting cost for freight under item No. 4 was $1.12 per ton, while this cost in item No. 8 was but 3 cents per ton. The former freight consists largely of mail order and other small package freight, the average weight of a shipment being but 265 pounds, while the average weight of a shipment in item No. 8 was 47,600 pounds.

Ordinarily, transportation costs are governed by length of haul and tonnage of cars, as well as by number of switching movements per car. However, in the case of this transfer, these costs are compiled on a basis of the number of switching movements, irrespective of the length of haul or tonnage.

Close observation for a period of four years has determined the number of primary switching movements necessary in the handling of the several classes of freight, so that in dividing the transportation cost, the number of cars of each class handled is multi-

plied by the number of movements necessary to that class of freight. This result, multiplied by the average cost per switch, fixes the amount charged to each class of freight.

For the month of December, 1914, the transportation cost was $30,629.87, and the number of switching movements, 115,177, making the average cost per movement, 26.59 cents.

The following figures show the number of switching movements charged against each class of freight, and the transportation cost (for December, 1914) per car: —

Transportation Costs, December, 1914.

Class of Freight.	Number of Switching Movements per Car.	Transportation Cost per Car.
No. 1. L.C.L. through freight, transferred at platform,	8	$2 13
No. 2. L.C.L. from receiving station, transferred at platform,	4	1 06
No. 3. L.C.L. from industries, transferred at platform,	4	1 06
No. 4. Interchange through unbroken bulk freight,	3	80
No. 5. From receiving stations, not transferred at platform,	4	1 06
No. 6. From industries, not transferred at platform,	4	1 06
No. 7. Interchange straight carload freight,	3	80
No. 8. Carload freight from industries,	5	1 33

With the exception of the Soo Line and the Northern Pacific, all roads deliver and pick up their cars at the limits of the transfer yards, so that, generally speaking, the Transfer Railway does not handle cars beyond the confines of their own yards. In the case of the Soo Line, the Transfer Railway makes a six mile haul in interchanging cars, and a haul of one-half mile is made in interchanging with the Northern Pacific.

Following are some averages for the month of December, 1914: —

Transportation cost, all freight handled, 5.51 cents per ton.
Transportation cost per car of freight, $1.05.
Transportation cost per car handled, loaded and empty, 42 cents.
Average number of engines worked per day, 15.7.
Average number of cars handled per day per engine, 89.3.
Average lading per car of L.C.L. transferred at platform, 5 tons.
Average lading per car of unbroken bulk freight, 6.5 tons.

As previously stated, the operating expenses are paid by the proprietary companies prorated on a tonnage basis, without

regard to the various classes of freight. That is, the total tonnage handled is divided by the total operating expense to determine the average cost per ton. In view of the great variation in the cost of handling the several classes of freight some of the interested parties are now making an effort to effect a change in the system of cost apportionment, whereby each road will pay on the tonnage of each class of freight handled by it. Such a plan would necessitate a division of the tonnage and service, similar to that shown in this report, and would mean an increase of 25 per cent. in the expense borne by certain roads, and a corresponding decrease in other roads.

The transfer of L.C.L. freight at the Minnesota Transfer is made at two parallel transfer platforms 16 feet wide and 900 feet long. These platforms are separated by six tracks — used for outbound cars — having a combined capacity of 132 cars.

The inbound cars are set on single tracks — one outside of and parallel to each platform — and freight trucked across the platform into the outbound cars.

The average daily L.C.L. transfer business is 475 tons — loaded into 95 cars.

The gang system of freight handling is used, — a gang consisting of five men, one checker, one caller and three truckers. The method of transferring freight is as follows: —

The way bills, which are made out in the general offices of the transfer, are sent to the general foreman, who marks each bill with the initial and number, and house number of the car into which the freight is to be loaded. The bills covering all shipments contained in one inbound car are then turned over to a checker, who enters that car with his gang.

As a shipment is loaded on a truck, the caller calls the markings and number of packages to the checker. The checker marks this information, together with the way bill or pro number, the number of the trucker who is to handle the shipment and the number of the car into which the shipment is to be loaded, on a "veri" check slip. This veri check is taken along with the load by the trucker. Each outbound car contains a large stamp showing the house number of the car, and when the trucker has unloaded his truck in the outbound car he stamps the veri check with the car number. When the trucker returns to the original car with his empty truck, he hands the veri check to the checker. A comparison of the car number shown of the

bill with the number stamped by the trucker shows whether the freight has, or has not, been loaded into the right car.

The cost of handling freight at this transfer platform averaged 33.1 cents per ton, for the month of December, 1914. The trucking cost was 36 per cent. of the total, or 12 cents per ton.

The cost of handling freight at the two receiving stations operated by the transfer averaged 24.5 cents per ton, making the total cost of handling L.C.L. freight received from teams, loaded into cars and transferred at the platform, 57.6 cents per ton.

HAMLINE TRANSFER OF THE GREAT NORTHERN RAILWAY AT ST. PAUL, MINN.

In order to concentrate the L.C.L. freight received at St. Paul and Minneapolis and the L.C.L. from the Minnesota Transfer, three of the roads interested in the Minnesota Transfer Railway have established and operate separate transfer platforms.

While the L.C.L. transfer facilities of the Minnesota Transfer are not, at present, utilized to more than one-third of their capacity, it is claimed that to handle L.C.L. city freight through this transfer means a delay of from twelve to twenty-four hours, while L.C.L. freight handled through the individual transfers of the several roads is forwarded the same day it is received.

The individual transfers now in operation are, —

Hamline Transfer of the Great Northern Railway.

North Town Transfer of the Northern Pacific Railway.

East Minneapolis Transfer of the Chicago, Milwaukee & St. Paul Railway.

These three transfers are constructed and operated in the same manner, and perform identical services for their respective roads. The Hamline Transfer of the Great Northern is, however, the largest of the three, and will therefore be described.

The Hamline Transfer is located between St. Paul and Minneapolis on the Great Northern Railway, within a mile of the Minnesota Transfer.

It consists of two parallel, covered platforms, each 16 feet wide and 1,200 feet long. These platforms are separated by a single track, and each platform has four tracks outside of and parallel to it.

Inbound cars received at the transfer are set on the center track — between the platforms — and freight is transferred in both directions across the platform into the outbound cars which are set on the tracks outside of the platforms. These outbound tracks have a combined capacity of 240 cars.

Freight is handled by the gang system, — a gang consisting of eight men, — a checker, a caller, a sealer and five truckers. All freight is weighed at this transfer before it is loaded into the outbound cars. One stower is worked for about every six cars *being loaded.*

This transfer receives freight from the receiving stations in Minneapolis and St. Paul and from the Minnesota Transfer. The latter is received early in the morning, while cars from the city receiving stations arrive at various hours during the day.

As the inbound cars are unloaded, fresh cars are pushed in at one end of the platform and the empties shoved out at the other end. A shift is usually made when ten cars have been made empty.

The force at the transfer begins work at 10 A.M. and works in the evening until all freight has been loaded out. The last cut of cars arrives from the city receiving stations about 6 o'clock, and are usually unloaded by 9.30 or 10 P.M. However, on heavy days it may be 11 or 11.30 when transferring is completed.

The amount of freight transferred at this platform daily runs from 1,000 to 1,100 tons — about 130 outbound cars — or an average load of eight tons per car.

The cost of handling freight at the transfer averages 41 cents per ton.

City Receiving Stations.

All L.C.L. freight received at the city receiving stations in Minneapolis and St. Paul is loaded into special "Jumbo" transfer cars. These cars are of standard box car construction, but are fifty-eight feet long inside and have two regular size doors in each side.

Freight is loaded into the "Jumbo" cars directly from the teams, and is not weighed until transferred at Hamline.

A checker, with one laborer, is located at each car door where freight is being received. Teams all enter the yard from the same direction and, during the busy hours, line up in the order of their arrival and are directed to a door by the yard foreman.

Loaded cars are switched from the receiving station four times daily, — at 10.30 A.M., 1, 4 and 5 P.M. The last switch ordinarily contains as many cars as the combined number of cars handled at the three earlier switches. In the early morning but one door is open, while late in the afternoon nine or ten doors will be receiving freight.

The average daily tonnage loaded at the city receiving station of the Great Northern in St. Paul, and forwarded to Hamline for transfer, was 168 tons, for the year 1914. The average load per "Jumbo" car was 12.5 tons.

The average cost of handling freight at the receiving station was 13.3 cents per ton.

The total cost of handling L.C.L. freight received at the city station and transferred at Hamline was 54.3 cents per ton.

Information in connection with this report was received from the following parties: —

Mr. H. A. Kennedy, vice-president, Minnesota Transfer Railway.
Mr. Douglas, agent, Minnesota Transfer Railway.
Mr. Thos. Carroll, agent, Hamline Transfer.
Mr. Harrison, agent, St. Paul Freight Station, Great Northern Railway.
Office of vice-president, Great Northern Railway.
Accounting department, Great Northern Railway.

UNIV. OF MICH.

CANADIAN CITIES.

Montreal.

Population, 1910, 470,480.

Belt Line. — Yes.

The belt railroad is owned by the Federal Government and operated by a Federal commission known as the Board of Harbour Commissioners. This road has 50 miles of tracks and an equipment of 7 engines, 15 coal and flat cars, and its own round houses, repair shops, etc. It does all of the switching to and from the water front for the railroads and a large percentage of the interchange for the railroads. It also serves a number of industries located on its lines. The belt line tracks run parallel to the water front for several miles. The engines of the road do the switching, but the belt road does not furnish any freight cars in connection with its service. Such cars as it has are for the use of the Harbour Commission. The belt road handled in 1914 114,449 cars as against 114,531 in 1913 and 70,856 in 1906. The latter was the first year that this road was operated by the Harbour Commission. Prior to that time, the Commissioners leased the tracks of the belt to one of the railroads and the other two roads paid their proportionate share to use the belt tracks. This arrangement, the Commissioners say, was unsatisfactory, and was attended by continual quarreling between the railroads. One road would clog the tracks at times, despite the protests from the other roads. To eliminate this, the Commissioners finally decided to operate the road themselves. They say that since then the handling of freight over the belt has been satisfactory to the railroads and has resulted in great benefit to the port.

Other Methods of Interchange. — The Grand Trunk, Canadian Pacific and Canadian Northern roads, the three transcontinental railroads entering Montreal, each maintain their own freight terminals and switching tracks and do some of their own switching.

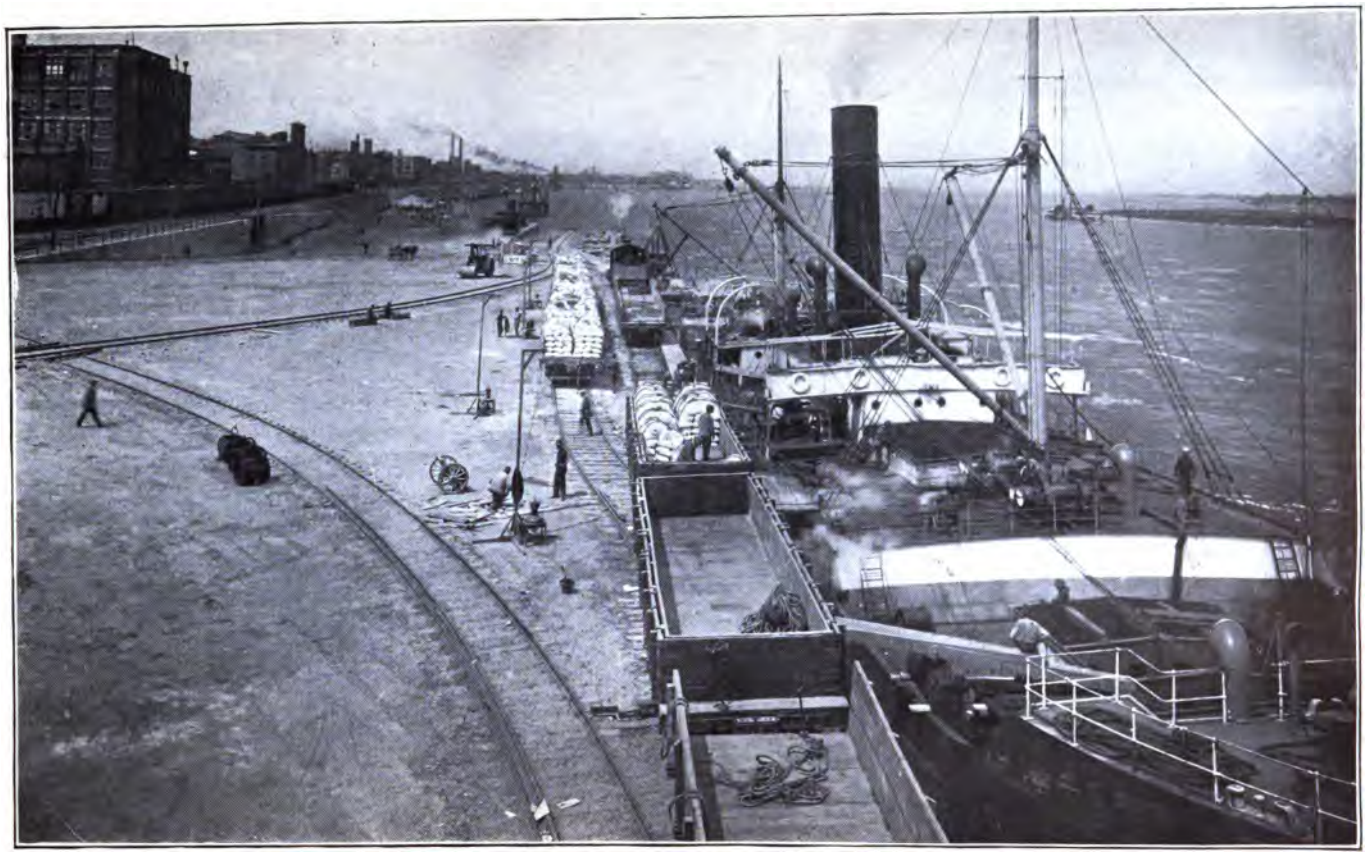
Interchange Charge. — The belt railroad makes a switching charge for freight cars brought within the harbour district, loaded or empty, except for through transfer from one railroad to another, of $2.50. On every car unloaded at more than one or two sections or sheds a further charge of $1 for each addi-

tional movement is made; the maximum charge for additional movements, however, cannot exceed $2 for any one car. On cars left unloaded on harbour tracks for over 72 hours after being received, an additional charge for each day of 24 hours is exacted. Belt engines place loaded cars at wharves and sheds to which they are destined at 7 o'clock each morning and take them out at noontime again, whether they are unloaded or not, to make way for a new lot of cars. The belt engines later move these cars, already moved in and out, back again to the sheds and wharves. If a third in and out movement is necessary, the Commissioners double the original switching charge. Cars for through transfer from one railway to another via the harbour tracks are switched by the belt for $5 for each loaded car and $2 for each empty car. Cars upon which the charge of $5 has been made are returned free of charge. The railroads charge each other for interchange at various rates. The charge runs as high as $12. The harbour officials say that the belt road can do the switching so much cheaper than the railroads that the latter use the belt whenever possible.

Proposed Improvements. — The Harbour Commissioners are following a broad plan for the general improvement of the terminal facilities of the port, which includes constant dredging of the river, construction of docks, enlarging the present docks, raising the height of the water-front bulkhead along part of the river front, and the enlarging of one of the two grain elevators so that it will have a capacity of 4,000,000 bushels.

The Canadian Northern Road plans to erect a splendid passenger station in the heart of the city. To reach the same, it is constructing a great railroad tunnel under Mount Royal. This tunnel is 3.1 miles long, is constructed at a depth of 600 feet below the summit, and is now nearly completed.

Notes. — Through the foresight of the early French officials, the water front of the city of Montreal is now and always has been owned by the Federal Government. Not a foot of water front is privately owned. The direction of the port is vested in a Board of Harbour Commissioners, created by act of Parliament. This Commission was appointed as early as 1830. Since 1906 the Commission has been comprised of three members appointed by the Governor in Council on recommendation of the Minister of Marine and Fisheries. The Commissioners hold office during the pleasure of the Government and the personnel of the Commission usually changes with the Government. Prior to



Loading of a Steamer from Cars on the Public Belt Railroad, Montreal.

1906 the Commission consisted of eleven members, six appointed by the Governor in Council; the mayor was ex officio a member; the other four members were elected by commercial organizations of the city. This board proved to be unwieldy. It is now composed of three members. The Commission holds and directs the operation of all of the terminal facilities along the water front. In addition to operating the belt railroad, it builds and maintains docks, grain elevators, towboats, dredges, lighters, etc.

The Commission has its own police force, which is charged with the maintenance of order and safety. It also has judiciary powers. Its regulations have the force of law when they have the approval of the Governor in Council, to whom they must be submitted. The Commission may take any property on or adjacent to the water front for the development of the harbour.

Montreal has 7.395 miles of wharves, of which 4.328 miles can accommodate ships of 30-foot draught. Under the terms of lease, any wharf not in actual use may be assigned for the use of any person who desires it. The money for the development of the harbour is obtained by act of Parliament authorizing the issue of Harbour of Montreal bonds. The revenue from the operation of the water-front facilities is supposed to cover all of the fixed and maintenance charges. In 1914 the total receipts on revenue account amounted to $1,466,364.27, while disbursements on revenue account amounted to $1,459,455.08.

Toronto.

Population, 1911, 376,538.

Belt Line. — No.

The Grand Trunk has a belt line of its own. This is used almost exclusively for Grand Trunk business.

Other Methods of Interchange. — Each railroad handles its own freight and does its own interchanging. The Grand Trunk and Canadian Pacific have two points of interchange designated by the Dominion Board of Railroad Commissioners, one at Royce Avenue on the northwest, and one at Bathurst Street in the center of the city on the water front. Interchange between the Canadian Northern and the Grand Trunk is in Rosedale in the northeast section of the city. The point of interchange between the Canadian Northern and the Canadian Pacific is in the east at the River Don. The reason for this is that the latter, the Canadian Northern, is the younger road and handles a very small

percentage of the freight business in Toronto. Two years ago a rather peculiar situation arose in Canada on the question of interchange business. The younger companies were coming in and providing inadequate facilities and taking advantage of the interchange situation, *i.e.*, for instance, take the case of the Canadian Northern Ontario at Toronto, where this company has but one yard which is at the Don River at the east end of the city, about one mile from the business center. Shippers routing their goods over the Canadian Northern Ontario to competitive points, or otherwise, would ask to have the same placed on either the Canadian Northern Ontario or the Canadian Pacific team track yards in the heart of the city. The Canadian Northern Ontario in this way was able to use the yards of the other companies under the interchange arrangement at the time, with no expense to it other than the absorption of the switching charge. The other roads complained, and as a result this business is not now handled and cannot be routed to the private team track and freight yards of another company.

Interchange Charge. — Interchange rates are on the basis of 1 cent per 100 pounds, with a minimum of $3 and a maximum of $8 for any car handled. From competitive points, any of the railroads will absorb the switching charge for any interchange business that is destined to a point within four miles of the point of interchange.

On non-competitive business, the railroads will absorb one-half of the switching charge, *i.e.*, the price becomes ½ cent per 100 pounds for any business within a four-mile limit from the point of interchange. Beyond the four mile limit they make no allowance whatever.

Proposed Improvements. — There has been formed at Toronto what is known as the Toronto Terminal Railway Company. All of the roads, except the Canadian Northern Railroad, are in this company. The company was organized to handle passenger terminal business. It will have jurisdiction over the main lines of a new viaduct and a new Union station, the latter being now in the course of construction. Each company will handle its own freight as at present.

Notes. — Three railroads enter Toronto, the Canadian Northern Ontario, the Canadian Pacific and the Grand Trunk Railway. Team track facilities throughout the different portions of the city are good. The despatch with which freight is handled by the Grand Trunk and the Canadian Pacific Railway companies,

doing the bulk of the business, is, the chief engineer of the Toronto Harbor Commissioners says, entirely satisfactory.

Vancouver, B. C.

Population, 1911, 100,401.

Belt Line. — No.

The Harbor Commission of Vancouver at present plans the construction of a belt line, over the tracks of which the cars of every railway entering the city will be switched.

Other Methods of Interchange. — The railroads do their own interchanging.

Interchange Charge. — No information.

Proposed Improvements. — The Harbor Commission is at present reclaiming 42 acres of tide flats on an arm of the sea opening off the outer harbor. A large dry dock and ship building industry to be subsidized by the Government are also contemplated as are a number of docks.

Notes. — The port of Vancouver is under the jurisdiction of a Federal Harbor Board like that in Montreal, which was created by an act of Parliament in 1913.

Vancouver has 98 miles of water front, nearly all of which is regarded as suitable for industrial and commercial purposes.

This port is the western terminus of the Canadian Pacific Railway. It is also served by the Great Northern Line from the State of Washington. The Grand Trunk Pacific has steamboat connections with Prince Rupert, its terminus on the Pacific coast. The Pacific Great Eastern also operates in the harbor.

The Government is constructing a new reinforced concrete wharf 800 feet in length and 300 feet in width. This wharf, which is nearly completed, will be equipped with sheds its entire length and with modern appliances for loading and discharging. Adjoining this wharf there is a great grain elevator just completed, which has a capacity of 1,250,000 bushels.

APPENDIX D.

REPORT FROM MANUFACTURERS' BLANKS.

INTRODUCTORY REMARKS.

As mentioned in the body of the report, the Commission sent out blanks to all manufacturers in Massachusetts, requesting information as to their freight facilities. Form No. 1 blanks were sent to manufacturers outside of Boston and Form No. 2 blanks to those within the city. Copies of these two forms are included in this appendix on opposite page.

There were about 8,500 blanks sent to manufacturers. The names were obtained from the Directory of Massachusetts Manufactures — 1913 — together with a supplementary list of new firms made up from names furnished by various Boards of Trade throughout the State. Answers were received from 1,257 manufacturers, and 245 letters were returned from firms out of business or who had moved. The 1,257 replies received represented 15 per cent. of the total number of blanks sent and the Commission feels that such a number of replies indicates a very great interest in the terminal problem of Boston. It is a well-known fact that manufacturers are generally averse to giving out any data pertaining to their business, and the fact that these replies came in answer to a single letter sent by the Commission, merely requesting this information, shows conclusively how vital the subject is to the manufacturers. Replies were received from every city in the State and from 125 towns. These replies represent 177 kinds of industries. Although firms of all sizes are included in the replies the presence of many large and important firms is particularly noticeable.

Of the total answers received, two-thirds had some definite information, either in answer to the questions or in remarks on the subject. The other third represented firms whose business was such that they used express or parcel post almost entirely, or firms whose business was so local that they had no particular data or information on the subject.

For purposes of analysis, the replies were tabulated with reference to the freight facilities of the various cities and towns. In doing this, answers were divided into four groups: (*a*) Boston, (*b*) Metropolitan District, (*c*) outer zone, and (*d*) remaining cities and towns in Massachusetts.

(*a*) Boston includes merely what is within the actual city limits at the present time.

(*b*) The Metropolitan District is the one adopted by the Public Service Commission and is made up of 29 cities and towns, including Boston. In general this district lies within 10 miles of the State House.

(*c*) The outer zone takes in the large manufacturing centers of Eastern Massachusetts with the exception of Fall River and New Bedford. In a general way it is bounded by a round-about route operated by the Boston & Maine and the New Haven roads from Newburyport via Lowell, Framingham, Mansfield, and Taunton to Plymouth. Practically all points along this route are included with the exception of Middleborough and Plymouth. The greatest distance from Boston to the extreme northerly or southerly points in this zone is about 35 miles, and westerly about 20 miles. In determining this zone the idea has been to pick the more important manufacturing centers which are vitally affected by terminal conditions at Boston. This outer zone, including the Metropolitan District, is made up of 119 cities and towns.

(*d*) Points outside the outer zone have been taken as a separate class. The cities and towns in this group have the least relation to the terminal problem of Metropolitan Boston.

Table I. shows the 1915 population and the 1913 value of manufactured products in the various zones and in the State as a whole. This table also gives a summary of the replies to the manufacturers' blanks, showing the classification of answers by the districts and zones considered. In this table the "replies tabulated" refer to those answers as mentioned above which give some definite information on this subject.

TABLE I.

Population and Manufactures.

DISTRICT.	Population, 1915 Census.	Per Cent. of State.	Value of Product, 1913.	Per Cent. of State.	Number of Cities.	Number of Towns.
Boston, ...	745,439	20.2	$252,222,872	15.2	1	-
Metropolitan District, .	1,536,576	41.6	543,500,000[1]	32.8	14	15
Outer zone, . . .	2,332,851	63.2	976,250,000[1]	58.9	23	96
Massachusetts, . . .	3,693,310	100.0	1,658,728,363	100.0	36	317

[1] Figures slightly approximate.

Summary of Manufacturers' Blanks.

DISTRICT.	Number of Blanks sent.	Number of Replies.	Number of Replies tabulated.	Firms using Express.	Local Business (no Data).
Boston, ...	2,150	283	146	52	85
Metropolitan District, .	3,500	468	277	67	124
Outer zone, . . .	5,600	789	488	84	167
Massachusetts, . . .	8,500	1,257	838	131	288

NOTE. — Firms out of business or moved, 245.

Table II. gives the various municipalities in the Metropolitan District and in the outer zone. The Metropolitan District as given is the one used by the Public Service Commission and consists of 29 cities and towns.

TABLE II.

Cities and Towns in Metropolitan District (Public Service Commission).

BOSTON.	MALDEN.	SOMERVILLE.
Arlington.	MEDFORD.	Stoneham.
Belmont.	MELROSE.	Swampscott.
Brookline.	Milton.	Wakefield.
CAMBRIDGE.	Nahant.	WALTHAM.
CHELSEA.	Needham.	Watertown.
Dedham.	NEWTON.	Winchester.
EVERETT.	QUINCY.	Winthrop.
Lexington.	REVERE.	WOBURN.
LYNN.	Saugus.	

14 cities, 15 towns.

TABLE II — Concluded.

Cities and Towns in Outer Zone, exclusive of Metropolitan District.

Abington.	Hamilton.	Norwood.
Acton.	Hanover.	Peabody.
Amesbury.	Hanson.	Pembroke.
Andover.	HAVERHILL.	Randolph.
Avon.	Hingham.	Raynham.
Bedford.	Holbrook.	Reading.
BEVERLY.	Hull.	Rockland.
Billerica.	Ipswich.	Rockport.
Boxford.	LAWRENCE.	Rowley.
Braintree.	Lincoln.	SALEM.
Bridgewater.	LOWELL.	Salisbury.
BROCKTON.	Lynnfield.	Scituate.
Burlington.	Manchester.	Sharon.
Canton.	Mansfield.	Sherborn.
Carlisle.	Marblehead.	Stoughton.
Chelmsford.	Marshfield.	Sudbury.
Cohasset.	Maynard.	TAUNTON.
Concord.	Medfield.	Tewksbury.
Danvers.	Methuen.	Topsfield.
Dover.	Merrimac.	Walpole.
Dracut.	Middleton.	Wayland.
Duxbury.	Millis.	Wellesley.
East Bridgewater.	Natick.	Wenham.
Easton.	Newbury.	West Bridgewater.
Essex.	NEWBURYPORT.	West Newbury.
Foxborough.	Norfolk.	Weston.
Framingham.	North Andover.	Westwood.
Georgetown.	Norton.	Weymouth.
GLOUCESTER.	Norwell.	Whitman.
Groveland.	North Reading.	Wilmington.

9 cities, 81 towns.

Total: 23 cities, 96 towns.

Answers to Questions on Manufacturers' Blanks.

Questions 1 and 2.

Question 1. — Average time to New York from place of business. (*a*) Carload shipments. (*b*) Less than carload shipments.

Question 2. — Average time from New York to place of business. (*a*) Carload shipments. (*b*) Less than carload shipments.

For Boston and the other points within the Metropolitan District the time for carload shipments to New York is very nearly the same as for less than carload shipments. On shipments coming *from* New York *to* Boston both *carload* and *less than carload* times are very nearly the same. On shipments *from* New York *to* points in the Metropolitan District, other than Boston, the *less than carload* shipments take about a quarter of a day longer than the *carload* shipments. For points in the outer zone, exclusive of the Metropolitan District, the *less than carload* shipments take about half a day longer than the *carload* shipments, both going *to* and coming *from* New York. The reason that the times are so nearly the same for both classes of shipments is probably due to two causes: (1) there is so much business to New York that "through" cars are operated to a great extent; (2) a considerable portion of the business is by boat lines which handle both classes of shipments in more or less the same manner.

With regard to the difference in "average" time between shipments *to* New York and *from* New York, the following observations may be made: shipments *to* Boston take about one-half day longer than those *from* Boston; other points in the outer zone show shipments taking about a day and a half longer *from* New York than those *to* New York.

Table III. has been prepared to show the mean times obtained in answer to questions 1 and 2 (shipments to and from New York) for Boston and various groups, covering all points in the outer zone as well as a few points outside this zone. This table shows the *maximum* and *minimum* times, the *mean* of the "average" times, and also the number of replies considered in each case. It is to be noted that the *mean* of the answers to the question of "average" times rather than the average of these answers is shown. Owing to the high maximum points and to the fact that most of the answers lie near the mean and not scattered uniformly between the minimum and the maximum, it appears that the mean gives the most representative value. It

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might be well to call attention to the fact that the mean is the point having as many answers above it as below it.

The number of replies shown in this table is the number of replies considered with regard to this particular question and is not the *total* number of replies received from the group of municipalities shown in the left hand column. Further consideration is given to this table in connection with tables IV. and V.

TABLE III. — *Shipments to and from New York.*

PLACES.	TO NEW YORK.				FROM NEW YORK.			
	Mean.	Maximum.	Minimum.	Number of Replies.	Mean.	Maximum.	Minimum.	Number of Replies.
BOSTON,	2.00	9.0	.50	89	2.50	7.0	.50	107
CAMBRIDGE, EVERETT, SOMERVILLE, CHELSEA.	2.25	14.0	.50	28	3.00	8.0	.50	29
LYNN,	2.25	4.5	1.50	9	4.50	7.0	3.00	8
MALDEN, MELROSE, Wakefield,	3.75	7.0	1.00	10	6.00	7.5	3.00	9
Arlington, Lexington, MEDFORD, WINCHESTER, WOBURN, Watertown, WALTHAM.	9.00	12.0	1.00	9	7.00	12.0	2.00	13
Reading, North Reading, Peabody, SALEM, BEVERLY.	3.75	10.0	2.00	17	5.75	10.0	2.00	21
GLOUCESTER,	3.00	8.5	2.00	5	6.00	10.0	5.00	3
NEWBURYPORT,	4.00	8.5	2.00	13	5.00	8.5	3.00	9
LAWRENCE, HAVERHILL,	3.25	7.0	1.00	25	4.75	15.0	3.00	25
LOWELL,	3.75	6.0	1.50	14	4.75	13.5	2.50	18
WORCESTER,	1.25	3.0	.50	26	2.25	6.0	.75	31
Dedham, QUINCY,	6.75	14.0	1.00	8	4.75	7.0	1.00	7
NEWTON, Needham,	5.25	10.0	1.00	7	7.00	10.0	1.00	8
Braintree, Canton,	3.00	5.0	1.00	9	4.00	8.5	2.25	10
BROCKTON,	1.75	14.0	.75	17	3.00	14.0	1.00	18
Hanover, Bridgewater, TAUNTON,	3.50	10.0	.75	13	3.50	10.0	.50	14
Norwood, Mansfield,	2.00	6.0	.75	7	3.75	8.5	1.50	8
Framingham, Sudbury,	3.50	5.0	.75	7	4.50	10.0	1.00	7
FALL RIVER, NEW BEDFORD,	1.00	4.0	.50	32	1.00	7.0	.50	35
North Attleborough,	3.50	4.5	3.00	3	3.75	4.5	3.00	5

NOTE. — Times are given in days.

Questions 3 and 4.

Question 3. — Average time to Chicago. (*a*) C.L. shipments. (*b*) L.C.L. shipments.

Question 4. — Average time from Chicago. (*a*) C.L. shipments. (*b*) L.C.L. shipments.

Boston replies show that *L.C.L.* shipments to Chicago move as fast as *C.L.* shipments. *From* Chicago *to* Boston, however, *L.C.L.* shipments take about a day longer than *C.L.* shipments. For other points in the outer zone, exclusive of Boston, *L.C.L.* shipments take from one to two days longer *to* Chicago and from two to three days longer *from* Chicago. With regard to Boston it may be noted that the operation of "through" cars and "fast freight" service such as the Merchants' Despatch probably causes the L.C.L. shipments to move about as fast as C.L. shipments especially on west bound traffic.

With regard to the difference in time between shipments from Chicago and those to Chicago, it may be noted that shipments *to* Boston take about a day and a half longer than those *from* Boston. For other points in the outer zone, shipments *from* Chicago generally take nearly three days longer than those *to* Chicago.

Table IV. shows the mean times obtained in answer to questions 3 and 4 (shipments to and from Chicago) for Boston and various groups covering all points in the outer zone as well as a few points outside of this zone. The information shown is of a similar nature to that shown in Table III. for shipments to and from New York.

The following summary shows the times each way between Boston and New York and Chicago. The "range of time" noted in this table is that period of time within which lie 75 per cent. of the answers. This range of time, in comparison with the maximum and minimum times, gives a good idea as to the general uniformity of the replies to these particular questions.

Question.	Number of Replies.	Mean Time.	Range of Time.	Maximum.	Minimum.
1. Boston to New York, . .	89	2.0	1 to 3	9.0	.5
2. New York to Boston, . .	107	2.5	1 to 4	7.0	.5
3. Boston to Chicago, . .	59	6.0	3.5 to 8.5	15.0	2.0
4. Chicago to Boston, . .	52	7.5	5 to 10	12.5	2.0

Note. — Times are given in days.

TABLE IV. — *Shipments to and from Chicago.*

PLACES.	TO CHICAGO.				FROM CHICAGO.			
	Mean.	Maximum.	Minimum.	Number of Replies.	Mean.	Maximum.	Minimum.	Number of Replies.
BOSTON,	6.00	15.00	2.00	59	7.50	12.5	2.0	52
CAMBRIDGE, SOMERVILLE, CHELSEA, EVERETT.	6.00	8.50	4.50	13	8.00	15.0	4.0	11
LYNN,	6.00	7.00	5.00	2	9.00	10.0	7.0	3
MALDEN, MELROSE, Wakefield,	7.50	10.00	5.50	6	12.50	12.5	12.5	1
Arlington, Lexington, MEDFORD, WINCHESTER, WOBURN, Watertown, WALTHAM.	11.00	14.00	4.00	9	11.00	21.0	4.5	10
Reading, North Reading, Peabody, SALEM, BEVERLY.	7.00	12.50	4.50	8	9.00	14.0	6.0	5
GLOUCESTER,	9.25	9.50	9.00	2	12.50	13.0	12.0	2
NEWBURYPORT,	6.75	10.00	5.50	4	11.50	14.0	10.0	4
LAWRENCE, HAVERHILL,	8.50	14.00	4.00	11	9.25	12.0	7.0	6
LOWELL,	10.00	18.00	5.75	5	14.00	21.0	7.5	10
WORCESTER,	5.75	14.00	2.50	10	7.00	14.0	2.5	12
Dedham, QUINCY,	12.00	27.00	5.00	4	13.50	15.0	10.0	3
NEWTON, Needham,	11.00	20.00	5.00	6	14.00	20.0	7.0	5
Braintree, Canton,	8.25	10.00	6.00	6	9.50	11.0	8.0	4
BROCKTON,	7.50	14.00	4.00	15	12.00	16.0	5.0	13
Hanover, Bridgewater, TAUNTON,	8.50	11.00	5.00	9	13.50	28.0	10.0	8
Norwood, Mansfield,	8.00	8.75	4.50	6	9.00	10.0	7.5	4
Framingham, Sudbury,	7.00	10.00	6.00	6	8.00	10.0	6.0	4
FALL RIVER, NEW BEDFORD,	9.00	14.00	4.50	13	8.25	12.5	5.5	9
North Attleborough,	10.50	10.50	10.50	1	10.50	10.5	10.5	1

NOTE. — Times are given in days.

Questions 5 and 6.

Question 5. — Average time *to* Lynn, Lawrence, Haverhill, Lowell, Worcester, Springfield, Fall River, New Bedford, Brockton and North Attleborough.

Question 6. — Average time *from* Lynn, Lawrence, etc.

Upon investigation of the answers to these questions it has been found that the time given *to* a certain point is in the majority of cases the same as the time given *from* that point. In order to get the most representative results, questions 5 and 6 have been considered as one question, and the average of the

two has been used in any case in which the times to and from a point are not given as the same.

Table V. has been made up to show the mean times between the particular points mentioned in questions 5 and 6 and all points within the outer zone as well as a few points outside of that zone. The varous cities and towns on the left hand side of the page are grouped in the same manner as shown in tables III. and IV., as these groupings represent points having more or less similar characteristics. It will be noted that Lawrence and Haverhill and also Fall River and New Bedford have been combined as their answers showed very similar times to the various points.

It should be mentioned that the route over which the shipments are made is not generally given. In fact, the route is indicated so seldom that it has been impossible to keep the mean times separate for different routes. This explanation applies to the answers to questions 1 to 4 as well. In like manner, it is generally impossible to tell which shipments represent those teamed to Boston and loaded at railroad stations there. It will be seen therefore that all these times are the mean of shipments over varying routes.

As mentioned in the introductory remarks, there is an outside route from Newburyport to Plymouth via Lowell, Framingham, Taunton, etc. Shipments between points in the outer zone, not located on the same division of a railroad, move via this line when not routed via Boston. Many of the routes via this line are considerably longer than those via Boston, especially between such points as Lynn and Brockton, etc., where the one or both points lie near Boston.

The following list shows the saving in mileage on shipments between certain of the points referred to in questions 5 and 6 when routed via Boston rather than via the outside route: —

Saving 10 to 15 Miles.

Lynn to Worcester.
Lawrence to Fall River, New Bedford and North Attleborough.
Haverhill to Fall River, New Bedford and North Attleborough.
Brockton to Worcester.

Saving 25 to 50 Miles.

Lynn to Fall River, New Bedford and North Attleborough.
Lowell to Brockton.

Saving over 50 Miles.

n to Lynn, Lawrence and Haverhill.

Although only a few points are shown here, it is evident that many shipments of this type travel considerably further when not routed via Boston. An extreme case such as Lynn to Brockton shows a saving of about 80 miles, the route via the round-about route being about 116 miles as against a route of 34 miles via Boston. Although this information as to length of routes via Boston was not obtained from the manufacturers' blanks, it seems well to refer to it here, as it accounts to some extent for the varying answers shown for different shippers.

In order to get an idea as to the rate of freight movement between local points, an endeavor has been made to show the mileage that freight moves per day between local points involving transfers, etc., as compared with the mileage moved per day by freight to and from Boston and some of these same points.

As tables III., IV. and V. show conditions nearly the same for Cambridge, Somerville, Chelsea and Everett as for Boston, these cities have been included with Boston in the study of rate of freight movement per day. The fact that these cities are similar to Boston is no doubt due to their shipping so much from Boston, especially on this class of local shipments.

It has been found for Boston (including the four cities named) that freight moves at the rate of 28 miles per day to and from the local points mentioned in questions 5 and 6.

Freight between Boston & Maine points other than Boston moves at the rate of 12.25 miles per day.

Freight between New Haven points other than Boston moves at the rate of 13.5 miles per day.

Freight between Boston & Maine and New Haven points and vice versa moves at the rate of 19.75 miles per day.

While these figures probably represent the conditions fairly well, it should be noted that in order to determine the length of the route it was necessary to make some assumption as to whether goods moved via Boston or not. For all points in the Metropolitan District it has been assumed that they went via Boston. For points outside of this district the distance via the outside route was used if it gave the shorter route. In case the round-about route was longer, the average of that route and the one via Boston was used.

By comparison of tables III., IV. and V. it will be seen that the cities and towns are grouped in the same manner. The groupings have been chosen as shown because the replies indicated that the conditions were similar for these points. In general the same

groups of suburban points are seen to have about the same grade of service to all the different points shown in tables III., IV. and V. A close observation of these tables shows the extra time shipments take to and from suburban points as compared with the time to Boston.

As mentioned above, the route is in some cases via Boston involving team transfer. In other cases via Boston and transferred by rail, and in still other cases via a route over the existing connections. As the route via team transfer at Boston is of course the quickest, it is evident that the times shown are not for the cases of rail transfer only and that these times are modified by the quick transfer on those shipments teamed across Boston. With this in mind it can be readily seen that the delay due to interchange and rail transfer routes alone, either in or outside of Boston, is even greater than that shown in the tables. Not enough definite information as to routes on individual shipments was given so that tables could be made up showing the exact delay due to interchange or rail transfer routes alone.

TABLE V. — *Shipments between Various Points in Eastern Massachusetts.*

PLACES.	MEAN TIMES.						
	Lynn.	Lawrence, Haverhill.	Lowell.	Worcester.	Fall River, New Bedford.	Brockton.	North Attleborough.
BOSTON,	1.00	1.00	1.00	1.25	1.25	1.00	1.25
CAMBRIDGE, SOMERVILLE, CHELSEA, EVERETT.	1.25	1.25	1.25	1.50	1.75	1.25	1.25
LYNN,	–	2.00	3.00	3.00	4.50	3.00	4.50
MALDEN, MELROSE, Wakefield,	1.25	2.00	2.00	3.25	2.75	2.00	1.75
Arlington, Lexington, MEDFORD, WINCHESTER, WOBURN, Watertown, WALTHAM.	3.25	3.25	3.00	3.25	4.00	4.50	3.50
Reading, North Reading, Peabody, SALEM, BEVERLY.	1.25	1.75	2.00	2.50	2.75	3.00	2.00
GLOUCESTER,	3.00	5.00	5.00	7.00	10.00	5.00	7.50
NEWBURYPORT,	1.25	2.25	2.75	3.25	2.75	2.50	3.00
LAWRENCE, HAVERHILL,	2.00	–	2.50	2.75	4.00	3.25	5.00
LOWELL,	3.00	2.50	–	2.50	4.00	3.25	5.00
WORCESTER,	3.00	2.75	2.50	–	3.25	3.00	3.00
Dedham, QUINCY,	7.50	8.50	7.00	6.75	4.00	2.75	4.50
NEWTON, Needham,	4.75	3.25	3.75	4.00	2.50	4.00	3.00
Braintree, Canton,	4.00	7.25	6.00	4.75	2.00	2.50	2.75
BROCKTON,	3.00	3.25	3.25	3.00	1.75	–	3.75
Hanover, Bridgewater, TAUNTON,	3.50	4.00	5.00	4.75	2.00	1.50	1.50
Norwood, Mansfield,	4.50	4.25	4.00	3.50	3.00	4.00	1.25
Framingham, Sudbury,	2.00	4.00	1.75	2.25	3.00	4.00	4.00
FALL RIVER, NEW BEDFORD,	4.50	4.00	4.00	3.25	–	1.75	3.50
North Attleborough,	4.50	5.00	5.00	3.00	3.50	3.75	–

NOTE. — Times are given in days.

Question 7.

Question 7. — How much time is lost by transfer of freight from rail to water?

There were 130 answers to this question. Although the figures given vary from 0 to 4 days, the general range of such answers is from 0 to 1½ days, and 1 day appears to be the most representative answer.

Questions 10 and 11.

Question 10. — Percentage of freight shipped at "this point."

Question 11. — Percentage of freight received at "this point."

The result obtained in answer to these questions is shown in connection with the answers to questions 18 to 21 inclusive.

Questions 12 and 13.

Question 12. — Proportion of all rail shipments made.

Question 13. — Proportion of all rail shipments received.

Most of the manufacturers considered an all rail shipment as a shipment continuously moving by rail after it was delivered to railroad either at local point or at Boston. This would include shipments via rail from local points and shipments teamed to Boston for rail shipment. It seems advisable to consider an all rail shipment in this way as by far the greatest number of answers showed this interpretation. Answers from 100 Boston shippers gave as an average 77 per cent. and 72 per cent. respectively for all rail shipments made and received. The average for the State, including about 500 replies, gave 69 per cent. and 75 per cent. respectively. From a consideration of these figures it would appear that 70 per cent. to 75 per cent. would be a representative figure both for goods sent and for goods received all rail.

Questions 14 to 17 inclusive.

Question 14. — Proportion of shipments railed to Boston teamed across city and railed again.

Question 15. — Proportion of shipments received by rail at Boston, teamed across city and railed again.

Question 16. — Proportion of shipments railed to Boston and teamed across city to boats.

Question 17. — Proportion of shipments received by boat at Boston and teamed across city and railed.

These questions were asked on Form No. 1, which was sent to points outside of the city of Boston. The following table shows the average percentages given in answer to these questions by groups and zones: —

Percentages of Shipments teamed across Boston.

	Question 14.	Question 15.	Question 16.	Question 17.
Metropolitan District (exclusive of Boston),	8.5	5.5	3.5	2.5
Outer zone (exclusive of Metropolitan District),	19.0	10.0	6.0	4.5
Outer zone (exclusive of Boston),	15.0	8.5	5.0	3.5
State (exclusive of outer zone),	1.5	1.5	2.5	.5
State (exclusive of Boston),	8.0	5.0	3.5	2.0

Observation of the above table, especially of the first, second and fourth groups, shows that this team transfer across Boston increases for points between the outside limits of the Metropolitan District and of the outer zone. It then diminishes when points are outside of this zone.

Within the Metropolitan District, Medford, Waltham, Woburn, Newton and Quincy are particularly noticeable for this team transfer across Boston.

Within the outer zone outside of the Metropolitan District, Newburyport, Beverly, Brockton, Gloucester, Haverhill, Salem and Reading show considerable team transfer at Boston. Lawrence, Lowell and Taunton, on the contrary, do not appear to ship a great deal via Boston.

Beyond the outer zone, Marlborough, Middleborough, Milford and Millbury are the only points using team transfer at Boston to any appreciable extent.

Questions 18 to 21 inclusive.

Question 18. — Proportion of shipments teamed to Boston for reshipment by rail.

Question 19. — Proportion of shipments received at Boston by rail and teamed to destination.

Question 20. — Proportion of shipments teamed to Boston for reshipment by boat.

Question 21. — Proportion of shipments received at Boston by boat and teamed to destination.

These questions appeared in Form No. 1 sent to all points outside of Boston.

By taking the answers to these questions in connection with questions 10 and 11 referring to proportion of shipments shipped at local points, it may readily be observed whether all the shipments from or to a point are accounted for. It will be noted in most instances that the sum of the answers amounts to 90 per cent. to 95 per cent. The reason for the discrepancy between this total and 100 per cent. appears to be due to the fact that in a few cases shippers based their percentages on total shipments presumably including express and local business, whereas most of the shippers based all percentages on freight shipments only, *i.e.*, assuming that their total freight shipments equalled 100 per cent.

Although questions 10 and 11 were originally intended to refer to the nearest shipping point for each shipper, the questions were generally interpreted to refer to the one or more local shipping points in a city or town and have been so considered in tabulating these replies.

The following table shows the average percentage of shipments given in answer to questions 10, 11 and 18 to 21 inclusive for various groups and zones: —

Percentages of Shipments teamed to and from Boston.

	Shipments made.				Shipments received.			
	Question 10.	Question 18.	Question 20.	Summary.	Question 11.	Question 19.	Question 21.	Summary.
Metropolitan District (exclusive of Boston),	53	28.0	10.0	91.0	63.0	20.0	8	91.0
Outer zone (exclusive of Metropolitan District).	93	1.0	.5	94.5	93.5	1.0	–	94.5
Outer zone (exclusive of Boston), . .	78	13.0	4.0	95.0	81.5	9.0	3	93.5
State (exclusive of outer zone), . . .	95	–	–	95.0	91.0	–	–	91.0
State (exclusive of Boston), . . .	86	7.5	2.5	96.0	86.0	5.5	2	93.5

An observation of this table, especially the first, second and fourth groups, will give an idea of the way the teaming to Boston drops off for points located at the outer limits of the Metropolitan District. In connection with this, it may be noted that within the Metropolitan District, Lynn, Needham and Newton

show the least teaming. In that portion of the outer zone outside the Metropolitan District, Salem, Peabody and Beverly are the only places showing any appreciable teaming to Boston. Outside of the outer zone there are no cities or towns showing any teaming to Boston. Table VI. gives the percentages of shipments involving team transfer (questions 14 to 31) for various points and groups.

TABLE VI. — *Team Transfer.*

PLACES.	PERCENTAGES.							
	Question 14.	Question 15.	Question 16.	Question 17.	Question 18.	Question 19.	Question 20.	Question 21.
CAMBRIDGE, SOMERVILLE, CHELSEA, EVERETT.	1	1	–	–	40	32	16	9
LYNN,	20	10	15	10	10	–	1	–
MALDEN, MELROSE, Wakefield,	–	1	3	1	52	22	16	15
Arlington, Lexington, MEDFORD, WINCHESTER, WOBURN, Watertown, WALTHAM.	8	8	1	2	33	32	8	10
Reading, North Reading, Peabody, SALEM, BEVERLY.	26	18	9	9	5	8	1	–
GLOUCESTER,	60	15	15	20	–	–	–	–
NEWBURYPORT,	30	30	8	15	1	–	–	–
LAWRENCE, HAVERHILL,	14	10	7	3	–	–	–	–
LOWELL,	2	3	7	5	–	–	–	–
WORCESTER,	1	2	–	–	–	–	–	–
Dedham, QUINCY,	20	12	2	1	13	3	3	2
NEWTON, Needham,	9	1	2	2	–	–	3	9
Braintree, Canton,	11	6	1	–	3	1	1	1
BROCKTON,	30	20	10	–	1	–	1	–
Hanover, Bridgewater, TAUNTON,	7	1	–	–	–	–	–	–
Norwood, Mansfield,	8	1	2	–	–	–	–	–
Framingham, Sudbury,	35	1	5	2	–	–	–	–
FALL RIVER, NEW BEDFORD,	1	2	1	1	–	–	–	–
North Attleborough,	–	–	–	–	–	–	–	–

Questions 22 and 23.

Question 22. — Proportion of shipments made in carload lots.

Question 23. — Proportion of shipments received in carload lots.

These two questions were asked only on Form No. 1, sent to places outside of Boston. About 250 answers to these questions for the outer zone, exclusive of the city of Boston, showed that

13 per cent. of shipments made are carload lots and 35 per cent. of shipments received are carload lots. For other points in the State, the proportions are 20 per cent. and 35 per cent. respectively. The whole State gives as an average of 475 answers 16.5 per cent. and 35 per cent. respectively. It would appear from these figures that 15 per cent. and 35 per cent. would be representative proportions for carload lots of shipments made and received.

Between points within Massachusetts it will be evident that the outbound shipments of one firm are the inbound shipments of other firms, and vice versa. These shipments do not necessarily balance, however, as business to and from the State complicates the matter. If the assumption is made that shipments to and from Massachusetts are of a more or less similar nature, it would appear that about the average of 15 per cent. and 35 per cent., that is, 25 per cent., would represent the proportion that carload business bears to total business.

Remarks on Manufacturers' Blanks.

There were over 400 of the tabulated replies which contained remarks of some sort. Of these, about 250 concerned the problem in question to some extent, and were considered in writing the report which follows. The remarks were divided readily into two classes: (1) General Railroad Situation. These considered the broader field of railroad service in Massachusetts as well as in Metropolitan Boston. (2) Boston's Problem. These latter remarks definitely concerned the terminal problem of Boston and vicinity.

1. *General Railroad Situation.*

The general remarks dealt with various phases of the railroad situation in Massachusetts, the most important of which was the service furnished by the railroads. The railroad service of Massachusetts was criticized most strongly on account of the delays at transfer points throughout the State. Seventeen replies stated that delays at such transfer points are the greatest hindrance to quick shipments, and most of the shippers were of the opinion that the delays were unnecessary or at any rate too great. It was claimed by several shippers that L.C.L. shipments are held at transfer points until a sufficient quantity accumulated to make a car worth while. Many shipments move via round-about routes, especially shipments within the outer

zone that travel over the existing connections of the New Haven and the Boston & Maine. This route often necessitates trips two or three times the length of the shortest route. Brockton to Lynn via Framingham and Lowell, compared with the route via Boston, furnishes a notable example. In general, delays at transfer points appear to apply to less than carload shipments to a greater extent than to carload shipments.

The beneficial effect of the electric freight and express has been marked in some parts of the State. Better service has been obtained between New Bedford, Taunton, Brockton, etc., and Boston, Worcester, Providence, etc. Short hauls formerly taking several days by railroad are now made by electric express in a few hours. This is especially true in cases where the old route via the New Haven was particularly round-about on such a comparatively short haul. It was stated that the addition of this electric freight service has also had the result of improving the New Haven service in some cases. It was urged that electric freight service be extended to Springfield and also to Northern Massachusetts points such as Lynn, Lawrence, Haverhill, etc.

2. *Boston's Problem.*

The following synopsis shows briefly the main features of the remarks which dealt with the problem of Metropolitan Boston: —

A. Freight Houses.
B. Transfers at Boston.
   (1) Union Freight Railroad.
   (2) Teaming.
   (3) Express Freight.
C. Service.
   (1) Shipments via Boston.
   (2) Time between Particular Points.
D. Suggested Improvements.
   (1) Belt Line.
   (2) Freight Terminals, etc.
   (3) Building up Boston's Through Shipping.

A. *Freight Houses, etc.* — In connection with the particular problem of Boston, two features stand out as of prime importance. One is the service at the freight houses, the other is the question of transfer between railroads, steamship lines, etc.

Regarding outbound shipments from Boston, several points are noted. One or two firms think that there are not enough

freight handlers at outbound houses. Teams are said to stand in line several hours before being able to discharge their load, and often doors are closed on them and they have to return the following day. One shipper thinks that there are not enough special type cars such as end door, low side cars, etc., for use for certain classes of goods. In general it is felt that shipments are all right after they get ten miles or so from the city limits, but that something should be done to expedite their movement through freight houses and yards.

By far the greater trouble, however, apparently is at the receiving stations. Answers from nine shippers indicate that a long delay is occasioned in placing and unloading cars after they reach the Boston yards. It is thought that this is due to lack of sufficient trackage facilities to keep up with modern business needs. As an instance, one shipper from a Boston & Albany point in Western Massachusetts claims that a car arrives in the Boston yards at 4 or 5 in the morning and that this car is often not placed until the afternoon of that day and sometimes not until the following day.

Seven replies indicate that there is serious trouble in teamsters getting goods after they have arrived at the freight house. It is claimed that goods become piled up in more or less confusion, unless the shipper is able to get goods on the day of their arrival.

A third cause of serious complaint is that incorrect information is often furnished as to location of goods or cars. One shipper says that it is a rare event to receive a shipment on the New Haven and have the incident go through smoothly. Frequently a teamster gets the cashier's check but finds that the goods are not unloaded and an extra trip is necessary. Seven answers refer particularly to faulty information from the railroad as a grave cause of delay in the receiving of freight.

One shipper suggests that goods be piled in separate piles for different shippers to obviate goods becoming lost or congested in freight houses. Another shipper thinks that the "particular door" delivery for outbound shipments is O.K., and is not a believer in the "one dump" theory. This shipper believes, however, that it is absolutely essential that the system be improved so that information as to the proper house and door be correctly and promptly given in every case.

B. *Transfers at Boston.* — (1) Union Freight Railway: As a method of transferring C.L. shipments from the Boston & Maine to the New Haven and vice versa, the Union Freight Railway is

generally considered slow. A Gloucester firm thinks that cars lay over twenty-four hours on their way to the Commonwealth and the Fish Piers. A South Boston shipper says that it generally takes three or four days to transfer from the Boston & Maine to his New Haven siding. A Fall River shipper claims that he has to allow ten days to two weeks to get cars to the Mystic Docks for export business in order to be sure of not missing a sailing. A Plymouth firm thinks that the transfer of car lots from New Hampshire points to Plymouth Division via Boston is very slow.

(2) Teaming: The problem of teaming in Boston appears to be of two general classes: first, teaming into Boston from local points for delivery to railroads or steamship lines; second, teaming across Boston from one railroad to another railroad or to a steamship line. Thirteen answers from local points refer to teaming to the railroads at Boston as a means of making quicker deliveries than by shipping from their local point. These answers came from Cambridge, Medford, Chelsea, Malden, Melrose, Winchester, Woburn, Lexington, Quincy, Dorchester and North Reading. Of course, many more firms showed in their answers to questions that they did some teaming to Boston, but the ones referred to above are those that particularly mentioned this subject in their remarks. The time saved by this method is given as from three to ten days over the time via rail shipment from the local points. A considerable number of firms indicate that they team to Boston to avoid loss of time even in the case of shipments destined to points on the same railroad on which they are located.

The teaming across Boston is of two general types: (*a*) shipments sent by freight to Boston, teamed across the city by a teaming company and then freighted over another road or a steamship line; (*b*) shipments sent into Boston by so-called express freight, teamed across city by the express company, and thence sent either by freight or by express freight to the destination. For convenience both of these methods have been considered under express freight.

(3) Express Freight: Many cities and towns outside of Boston ship their goods through Boston by express freight. Under this system the goods are collected at the local factory by the express company, shipped to Boston by rail in a car consigned to the express company and which is covered by a blanket bill of lading. At Boston the goods are distributed by the express company to

the proper outward line, at which points express receipts are exchanged for bills of lading and goods then go to destination either by freight or by express freight. This service in general appears satisfactory as to elapsed time, but of course the expense is greater than when goods are sent via routes outside of Boston. Twenty-one replies indicated the use of the above service, Lynn appearing most prominently. Other answers were from Salem, Beverly, Peabody, Newburyport, Lawrence, Wakefield, Haverhill, Woburn, Medfield, Natick, Brockton, Dighton, etc. A great advantage of this method appears to be in its enabling shippers from outside points to get "through car" and "fast freight" service from Boston on Western shipments.

C. *Service.* — (1) Shipments via Boston: Seventeen answers mention shipping through Boston for quick service to other points on the same or on another railroad or division. In most cases these shipments are at an additional cost but the time saved appears worth it to the shippers. There is another class of shippers, however, who do not ship via Boston at present owing to the increased cost, but who advocate being allowed to ship in this way at the same rates as over other routes outside of the city. Amesbury, Newburyport and Gloucester shippers are prominent in these answers. At present manufacturers at such points can ship via Boston at the same rates as via other routes on shipments to New York City and to points west of Buffalo. They wish to be allowed to make nearby shipments and in general shipments for all points east of Buffalo at the same rates via Boston as via other routes. At present for such points they must route via Salem Transfer and they claim this a very slow and unsatisfactory way.

The trouble at Salem is said to be due to the fact that outbound freight trains do not leave for a considerable time after the inbound trains arrive. Service for western points and for Mystic Docks is claimed to be often delayed a day or more at this point for this reason. A considerable number of replies from other points stated that they wished to be allowed to route via Boston at the lowest rates; because the direct service to Boston is generally so prompt that they could save considerable time via Boston routing.

(2) Time between Particular Points: Many of the shippers stated times for typical shipments between various points in the State, and among these it is particularly noticeable that Chicopee, New Bedford and Fall River claimed better service to

New York than to Boston, and therefore a great deal of business is diverted to that port. Several manufacturers in Worcester, Gardner and Haverhill also mentioned routing foreign shipments via the port of New York. The service as outlined by various manufacturers in Quincy appears to be particularly poor both in delays on shipments to Boston, which should be prompt owing to the short distance and the direct route, and also in delays on shipments to other New Haven points and to Boston & Maine points in northern Massachusetts.

D. *Suggested Improvements.* — (1) Belt Line: Six answers advocated a belt line connecting all the railroads to facilitate freight movements. These answers came from Hyde Park, Hanover, Waltham, Quincy, Newton and Franklin. Many other answers indicated that better transfer facilities were necessary but did not specify a belt line particularly. The Indiana Harbor Belt Line at Chicago was suggested as an example of what such a belt line would do for Boston.

(2) Freight Terminals, etc.: One reply advocated a terminal for all railroad and steamship lines. Another suggested locating steamship lines nearer together to save loss of time in teaming. One answer suggested that the Boston & Maine should have a central freight depot near Boston (not at Sullivan Square). Four replies suggested a union freight terminal for the three standard gauge railroads. One shipper suggested an underground freight station with improved facilities for handling freight and with proper arrangements to avoid teaming congestion at approaches and exits.

One firm suggested elimination of Union Freight tracks from Atlantic Avenue to save congestion in that part of the city. A tunnel or bridge for teaming was suggested from Chelsea to Boston. One firm believed in improved facilities, but did not think that a tunnel between the North and South Stations would be flexible enough for future expansion.

Freight House Changes: A cashier's office was urged near new East Cambridge freight sheds in order to save the half mile trip to Minot Street to prepay all freight on shipments sent from or received at this point. A receiving station near Mystic Avenue, East Somerville, was suggested, this station to receive freight for *all* points. It was also urged that delivery of carload and less than carload freight be made at this point. This request had been refused by the Boston & Maine in the past. This shipper believed, however, that this move would help to build up new

industries in this vicinity. A freight house in East Cambridge for western freight shipments is desired. A regular freight station was urged at Park Street, Somerville. Freight comes in here but has to be prepaid at Boston which occasions much delay. At present shipping papers have to be made out at Warren Bridge for such shipments.

(3) Suggestions for Building up Boston's Through Shipping: Better boat service to Philadelphia and Baltimore was advocated, and the suggestion made that steamers from Java be encouraged to call at Boston. It was stated that the freight rate to Java would probably be somewhat lower to many Massachusetts points via Boston than via New York.

Two firms mentioned service to Pacific Coast points via the Panama Canal. They stated that boats call at Boston and then at New York about ten days later. As freight rate via New York is about the same, shippers can send goods later via New York. It was thought that a direct service from Boston to Pacific points would bring more business through Boston from Massachusetts and New England points.

Summary and Conclusions.

From a careful study of the results obtained in the answers to questions, together with a consideration of the "remarks," the principal features of the railroad service in Massachusetts, and especially in Boston and vicinity, appear to be as follows: —

I. Round-about routes.
II. Transfer points.
III. Boston's freight house and yard facilities.
IV. Boston's transfer facilities.

I. *Round-about Routes.* — Shipments originating on one division of a railroad and destined to points on another division of that railroad or to points on a different railroad have in general two possible routes: one via Boston (referred to under another heading); and the other via existing connections at a considerable distance from Boston. The route via existing lines, *i.e.*, involving a haul over some part of the Boston & Maine and the New Haven connections outer belt already referred to, necessitates in many cases a greatly increased length of haul as compared with the route via Boston. For instance, shipments originating near Boston for delivery at points near Boston, not on the same

division, have no short or direct route by which they can travel except by transfer through Boston. For such shipments the outside route, generally the cheapest, is evidently very circuitous.

II. *Transfer Points.* — Shipments moving over existing lines are subject to frequent transfers, and the delays at such points are considered excessive, especially in the case of less than carload shipments.

III. *Boston's Freight House and Yard Facilities.* — (*a*) Outbound houses appear to give fair service except that the "segregated" door system necessitates a teamster's visiting many houses and doors to deliver a load of shipments, containing goods for several points. This feature naturally tends to congest freight yards with teams.

(*b*) Inbound houses are a cause of considerable delay. These delays are due to goods becoming lost in the houses, cars not being "spotted" or unloaded promptly, and to erroneous information being furnished by the railroad as to location of goods and cars.

IV. *Boston's Transfer Facilities.* — (*a*) Grand Junction service is good as far as it goes but is limited by the fact that it serves as a means of interchange for carload shipments only, and then only between the Boston & Maine and the Boston & Albany and vice versa.

(*b*) Union Freight service is slow. This service is handicapped owing to the fact that it is operated over the city streets and is therefore subject to severe limitation by city ordinances as well as to physical limitation by traffic, etc., along its route. Furthermore, the route between the New Haven yards at South Boston and the Boston & Maine is round-about. At present a car from these yards must move by a tedious process from South Boston, to the South Terminal yards, and thence across the Boston & Albany tracks for ultimate delivery to the track of the Union Freight at the Kneeland Street yards, at which point the car is ready to start its slow movement through Dewey Square, Atlantic Avenue, etc., to the North Station.

(*c*) Teaming across Boston between the railroads involves additional expense to the shipper, not to mention breakage, theft, etc., in the constant rehandling of the goods. The street traffic is thereby greatly increased and congested by this class of traffic which neither originates nor terminates in Boston. The entire business of the city is affected by any undue congestion of the

main arteries of traffic, yet no one in Boston is benefited by this business except a number of teamsters and cartage firms.

The teaming question is further complicated by the large traffic teamed from nearby suburban cities and towns direct to the freight stations in Boston. Shipments of this nature are generally sent to Boston to save railroad transfer, etc. It is evident that such teaming is generally across the city, as the shipments are mainly from northern points to southern freight terminals and vice versa.

Another feature may be mentioned which tends to increase teaming and attendant congestion. At the present time freight for a certain road can only be delivered to the freight station of that road, *i.e.*, of course except when it is to be transferred at points considerably outside of Boston. For this reason firms located in the southern part of the city have an excessive haul on goods bound for Boston & Maine points. It may be readily seen that all firms, except those equally distant from each of the freight terminals, have considerable hauling which would be unnecessary if the various freight stations were "universal" receiving stations.

From the above summary there appears this conclusion, namely, that a more flexible means of interchange should be established, and that a better and quicker means of shipping and receiving goods at freight stations should be obtained. Any solution of the interchange problem would undoubtedly solve the freight house problem to a great extent; for the elimination at Boston freight houses of the two handlings of all goods destined for team transfer across the city would relieve the strain at the freight houses to such an extent that legitimate Boston business could be handled expeditiously. Better interchange facilities would eliminate the street congestion due to teaming across the city and to the teaming from suburbs on one side of the city to freight stations on the other side of the city. Furthermore, good interchange would make it possible to have goods for a point on any of the railroads received at any of the freight stations, decreasing considerably the average length of haul for most of the shippers. Elimination of some of the teaming would permit of the Union Freight service being increased. By extension of the Union Freight tracks across Northern Avenue Bridge a more direct route would be established to the New Haven freight yards, and the blocking of streets near Dewey Square would be obviated.

From the evidence submitted it is evident that existing interchange facilities such as the present outside route are not satisfactory. This line does not give efficient service of this sort, as it involves too many transfers, crosses the radial lines too far from the city, and necessitates excessively long and round-about hauls on business originating within and destined to points within this zone and near Boston.

APPENDIX E.

ASSESSED VALUATION OF RAILROADS AND STREET RAILWAYS.

In order to get an idea as to the assessed valuation of railroad and street railway property within Metropolitan Boston and within the outer zone referred to elsewhere in this report, the Commission sent out letters to all of the 119 cities and towns located within this zone. These letters asked for specific information as to the assessed valuation in 1915 of railroad and street railway property outside of the five-rod limit.

The questions were as follows: —

I. What is the total valuation of the railroad property in your municipality?
   - A. Land.
   - B. Buildings.
   - C. Machinery.

II. What is the total valuation of railroad property not used for railroad purposes?
   - A. Land.
   - B. Buildings. (Including property owned by railroad companies and rented to other persons or companies.)

III. What is the total valuation of the street railway property in your municipality?
   - A. Land.
   - B. Buildings.
   - C. Machinery.

IV. What is the total valuation of street railway property in your municipality not used for railroad purposes?
   - A. Land.
   - B. Buildings. (Including property owned by railway companies and rented to other persons or companies.)

V. What is the total valuation of property owned and used by shipping companies for shipping purposes?
   - A. Land.
   - B. Wharves and buildings.
   - C. Machinery.

Replies were received from the 23 cities and from 92 out of the 96 towns within the outer zone. No replies were received from Hamilton, Nahant, Newbury or Norton, although considerable effort was made by the Commission to get the information from these four towns.

In addition to tabulating the information submitted by these cities and towns, the Commission obtained from the Tax Commissioner's books the total assessed valuation of railroad and street railway property within these municipalities. This was done in order to get the information for the missing towns and also to serve as a guide to the interpretation of the answers from a few of the towns. This was found desirable as there appeared some confusion in the answers from certain cities and towns.

In general, questions I. and III., dealing with the total valuation of railroad and street railway property, were answered satisfactorily. Questions II. and IV. however, dealing with the valuation of railroad and street railway property not used for railroad purposes, were not answered in some cases, particularly in the cases of the cities of Boston and Somerville. As these two cities represent such a large proportion of the railroad and street railway valuation, the tabulation of questions II. and IV. would not be of much use without them. For that reason these two questions were not tabulated. Question V., as to the valuation of property of shipping companies, was not answered satisfactorily, and was therefore omitted from the tables.

Table I. gives the total valuation of railroad property. The first column gives the information as obtained from the Tax Commissioner's books and the other columns give the information as obtained from the various municipalities.

Section *a* of this table gives the Metropolitan District as adopted by the Public Service Commission and which is made up of 29 cities and towns. This section also contains the information for the remaining 10 towns which are included within the Metropolitan District as considered by the Massachusetts Bureau of Statistics in their reports.

Section *b* gives the cities and towns that lie between this larger Metropolitan District and a twenty-mile circle from the State House.

Section *c* gives the remaining cities and towns which make up the outer zone as defined elsewhere in this report.

Table II., sections *a*, *b* and *c*, represents the valuation of

street railway property. The information is shown in a manner similar to that of Table I.

Table III. gives the valuation of railroads, street railways, and the total valuation of railroads and street railways for Boston, the two Metropolitan Districts, the 20-mile zone and the outer zone. The Tax Commissioner's total as well as the city and town detailed figures are given in this table.

As mentioned above there were some discrepancies in the detailed figures for the various cities and towns as compared with the Tax Commissioner's totals. The time that the Commission had was so brief that it was not possible to send representatives to these cities and towns to check up their figures. From an observation of the tables, however, it is evident that the grand totals for these districts and zones are substantially the same for the Tax Commissioner's figures and for the figures submitted by the cities and towns. For that reason the Commission feels that for the purposes of this investigation such totals show close enough results as to the assessed valuation of railroad and street railway property outside of the five-rod location.

It should be remembered that the valuations assessed by the cities and towns include neither the value of the five-rod location, the valuation of bridges and structures on that location, the value of tracks, rolling stock, etc., nor the original cost of construction. It should be kept in mind that the value of these latter items would add very greatly to the total valuation of railroads and street railways as "going" concerns.

TABLE I. *a.* — *Valuation of Railroads.*

	Tax Commissioner's Total.	City or Town Total.	City or Town.		
			Land.	Buildings.	Machinery.
BOSTON,	$80,426,200	$80,426,200	$62,743,100	$17,277,100	$406,000
Arlington,	48,160	48,160	38,760	9,400	–
Belmont,	59,350	59,350	30,750	28,600	–
Brookline,	62,400	62,400	57,400	5,000	–
CAMBRIDGE,	3,239,400	3,239,400	2,608,600	627,800	3,000
CHELSEA,	296,150	295,450	268,950	26,500	–
Dedham,	978,500	978,500	419,700	258,800	300,000
EVERETT,	104,200	104,200	81,200	23,000	–
Lexington,	63,900	63,900	60,650	3,250	–
LYNN,	1,248,895	1,248,895	1,080,845	168,050	–
MALDEN,	298,700	298,700	234,000	64,700	–
MEDFORD,	209,200	209,200	159,600	42,600	–
MELROSE,	79,400	79,400	63,700	15,700	–
Milton,	2,500	2,500	1,500	1,000	–
Nahant,	–	–	–	–	–
Needham,	43,425	43,225	43,225	–	–
NEWTON,	925,600	925,600	766,400	159,200	–
QUINCY,	890,225	889,625	785,850	103,275	500
REVERE,	635,250	635,250	600,400	34,850	–
Saugus,	12,138	12,138	10,838	1,300	–
SOMERVILLE,	405,900	6,419,300	5,468,100	283,300	667,900
Stoneham,	12,020	12,020	5,320	5,700	1,000
Swampscott,	57,000	57,000	57,000	6,300	–
Wakefield,	67,905	64,855	49,805	15,000	–
WALTHAM,	242,200	242,200	209,800	32,400	–
Watertown,	246,750	258,250	211,750	46,500	–
Winchester,	40,100	40,100	32,000	8,100	–
Winthrop,	159,900	167,600	146,300	21,300	–
WOBURN,	230,344	233,369	170,694	62,175	500
	$97,085,712	$97,116,787	$76,399,937	$19,337,950	$1,378,900
Braintree,	$397,875	$388,300	$191,000	$195,300	$2,000
Canton,	24,300	24,300	9,600	14,700	–
Cohasset,	19,510	16,510	4,010	11,500	1,000
Dover,	720	1,720	720	1,000	–
Hingham,	108,575	108,575	6,225	37,350	65,000
Hull,	279,805	279,805	214,355	64,450	1,000
Wellesley,	297,950	297,950	224,400	73,550	–
Weston,	19,000	19,000	19,000	–	–
Westwood,	19,800	19,800	19,800	–	–
Weymouth,	11,575	11,575	9,450	2,125	–
	$1,179,110	$1,167,535	$698,560	$399,975	$69,000

TABLE I. *b.* — *Valuation of Railroads.*

	Tax Commissioner's Total.	City or Town Total.	City or Town.		
			Land.	Buildings.	Machinery.
Abington,	$26,080	$26,080	$8,600	$17,480	–
Acton,	12,775	12,775	10,775	2,000	–
Avon,	1,300	1,300	800	500	–
Bedford,	9,400	9,400	1,000	8,400	–
BEVERLY,	57,925	57,925	50,825	7,100	–
Billerica,	2,031,230	2,031,230	25,255	1,238,605	$767,370
BROCKTON,	1,005,025	1,005,025	807,725	197,300	–
Burlington,	–	–	–	–	–
Carlisle,	–	–	–	–	–
Concord,	58,502	61,192	20,530	29,290	11,372
Danvers,	19,900	23,400	19,900	3,500	–
Framingham,	424,330	424,680	340,430	84,250	–
Hanover,	2,300	2,300	400	1,900	–
Holbrook,	18,400	18,400	16,400	2,000	–
Lincoln,	900	900	900	–	–
Lynnfield,	600	600	600	–	–
Marblehead,	13,800	13,800	10,900	2,900	–
Maynard,	4,620	4,620	2,620	2,000	–
Medfield,	19,550	20,550	14,550	6,000	–
Middleton,	3,340	6,340	2,240	3,000	1,100
Millis,	1,000	1,000	1,000	–	–
Natick,	164,625	164,625	105,200	59,425	–
Norfolk,	11,845	11,845	3,820	8,025	–
North Reading,	1,175	1,175	125	1,050	–
Norwell,		–	–	–	–
Norwood,	272,000	272,000	123,900	143,100	5,000
Peabody,	88,400	85,500	78,100	7,400	–
Randolph,	13,250	13,400	4,400	9,000	–
Reading,	26,360	26,360	19,560	6,800	–
Rockland,	10,200	10,200	2,200	8,000	–
SALEM,	582,200	586,700	417,500	151,200	18,000
Scituate,	27,245	27,245	8,045	19,200	–
Sharon,	18,000	27,600	20,600	7,000	–
Sherborn,	800	800	800	–	–
Stoughton,	62,015	62,015	23,765	37,950	300
Sudbury,	5,625	5,575	5,575	–	–
Tewksbury,	7,225	7,225	7,225	–	–
Topsfield,	1,300	300	300	–	–
Walpole,	30,175	30,275	18,375	11,900	–
Wayland,	4,875	4,875	2,575	2,300	–
Wenham,	4,700	4,700	2,000	2,200	500
Whitman,	30,540	30,540	5,300	25,240	–
Wilmington,	51,560	51,560	15,245	35,315	1,000
	$5,125,042	$5,146,032	$2,200,060	$2,141,330	$804,642

TABLE I. *c.* — *Valuation of Railroads.*

	Tax Commissioner's Total.	City or Town Total.	City or Town.		
			Land.	Buildings.	Machinery.
Amesbury,	$13,848	$8,000	$5,000	$3,000	-
Andover,	39,900	29,600	12,600	17,000	-
Boxford,	2,285	2,285	1,215	1,070	-
Bridgewater,	6,000	6,000	6,000	-	-
Chelmsford,	17,865	17,865	5,900	11,965	-
Dracut,	-	-	-	-	-
Duxbury,	2,553	2,553	428	2,125	-
East Bridgewater,	4,325	4,325	1,650	2,675	-
Easton,	11,835	11,835	2,910	8,925	-
Essex,	8,536	7,536	1,660	2,650	$3,226
Foxborough,	14,500	14,350	7,750	6,600	-
Georgetown,	5,350	5,300	1,900	2,700	700
GLOUCESTER,	26,400	26,900	26,200	700	-
Groveland,	3,800	2,900	2,200	700	-
Hamilton,	10,950	10,950	10,950	-	-
Hanson,	575	575	575	-	-
HAVERHILL,	483,225	485,300	382,175	102,625	500
Ipswich,	24,750	24,450	10,050	13,800	600
LAWRENCE,	1,179,975	1,179,975	879,250	298,225	2,500
LOWELL,	826,285	826,285	564,335	261,950	-
Manchester,	16,500	16,500	12,200	4,300	-
Mansfield,	89,540	89,940	19,990	42,750	27,200
Marshfield,	5,175	5,175	3,975	1,200	-
Methuen,	8,800	13,500	7,200	6,300	-
Merrimac,	-	-	-	-	-
Newbury,	350	350	350	-	-
NEWBURYPORT,	98,480	101,000	53,400	47,600	-
North Andover,	4,900	4,910	4,910	-	-
Norton,	13,400	13,400	13,400	-	-
Pembroke,	-	-	-	-	-
Raynham,	2,300	2,300	1,300	1,000	-
Rockport,	29,650	29,650	19,300	9,850	500
Rowley,	2,101	2,101	1,476	625	-
Salisbury,	2,200	2,200	1,500	700	-
TAUNTON,	264,340	264,340	99,740	149,100	15,500
West Bridgewater,	10,850	10,850	5,050	5,800	-
West Newbury,	-	-	-	-	-
	$3,231,593	$3,223,200	$2,166,539	$1,005,935	$50,726

TABLE II. *a.* — *Valuation of Street Railways.*

	Tax Commissioner's Total.	City or Town Total.	City or Town.		
			Land.	Buildings.	Machinery.
Boston,	$19,169,300	$19,169,300	$5,542,700	$13,551,600	$75,000
Arlington,	189,452	189,452	29,452	120,000	40,000
Belmont,	–	–	–	–	–
Brookline,	366,600	366,600	118,600	153,000	95,000
Cambridge,	3,864,400	3,832,400	1,462,900	1,655,100	714,400
Chelsea,	578,950	578,950	130,450	188,500	260,000
Dedham,	1,500	1,500	1,500	–	–
Everett,	184,400	184,400	87,600	96,800	–
Lexington,	90,000	90,000	8,500	81,500	–
Lynn,	798,500	798,500	101,450	197,050	500,000
Malden,	296,600	296,600	124,600	109,700	62,300
Medford,	399,750	399,750	76,800	123,150	200,000
Melrose,	44,000	44,000	6,000	38,000	–
Milton,	10,000	10,000	3,500	6,500	–
Nahant,	20,600	20,600	20,600	–	–
Needham,	3,150	3,150	3,150	–	–
Newton,	235,900	235,900	85,950	104,950	45,000
Quincy,	1,174,075	1,180,575	214,525	340,150	625,900
Revere,	142,050	142,050	82,850	51,200	8,000
Saugus,	2,000	2,000	2,000	–	–
Somerville,	462,000	462,000	164,200	272,800	25,000
Stoneham,	11,390	11,390	10,590	800	–
Swampscott,	67,500	67,500	44,500	23,000	–
Wakefield,	40,825	40,825	6,500	14,325	20,000
Waltham,	81,800	81,800	16,900	64,900	–
Watertown,	120,600	120,600	47,100	73,500	–
Winchester,	700	700	700	–	–
Winthrop,	3,150	3,150	650	500	–
Woburn,	378,028	278,335	10,200	145,695	222,440
	$28,737,230	$28,712,027	$8,404,267	$17,414,720	$2,893,040
Braintree,	$69,715	$66,715	$8,900	$57,815	–
Canton,	48,000	48,000	1,500	40,500	$6,000
Cohasset,	–	–	–	–	–
Dover,	–	–	–	–	–
Hingham,	13,750	13,750	5,250	8,500	–
Hull,	1,875	1,875	1,875	–	–
Wellesley,	114,900	114,900	13,400	51,500	50,000
Weston,	–	–	–	–	–
Westwood,	47,100	31,000	9,500	21,000	500
Weymouth,	61,050	61,050	6,100	29,950	25,000
	$356,390	$337,290	$46,525	$209,265	$81,500

TABLE III. — *Railroad and Street Railway Valuation.*

Railroads.

	Tax Commissioner's Total.	City or Town Total.	City or Town.		
			Land.	Buildings.	Machinery.
Boston,	$80,426,200	$80,426,200	$62,743,100	$17,277,100	$406,000
Metropolitan District (10-mile zone).	97,085,712	97,116,787	76,399,937	19,337,950	1,378,900
Metropolitan District (39 cities and towns).	98,264,822	98,284,322	77,098,497	19,737,925	1,447,900
20-mile zone,	103,389,864	103,430,354	79,298,557	21,879,255	2,252,542
Outer zone,	106,621,457	106,653,554	81,465,096	22,885,190	2,303,268

Street Railways.

Boston,	$19,169,300	$19,169,300	$5,542,700	$13,551,600	$75,000
Metropolitan District (10-mile zone).	28,737,230	28,712,027	8,404,267	17,414,720	2,893,040
Metropolitan District (39 cities and towns).	29,093,620	29,049,317	8,450,792	17,623,985	2,974,540
20-mile zone,	31,041,640	30,997,072	8,738,837	18,573,160	3,685,075
Outer zone,	33,046,578	33,019,082	9,162,687	19,626,535	4,229,860

Railroads and Street Railways.

Boston,	$99,595,500	$99,595,500	$68,285,800	$30,828,700	$481,000
Metropolitan District (10-mile zone).	125,822,942	125,828,814	84,804,204	36,752,670	4,271,940
Metropolitan District (39 cities and towns).	127,358,442	127,333,639	85,549,289	37,361,910	4,422,440
20-mile zone,	134,431,504	134,427,426	88,037,394	40,452,415	5,937,617
Outer zone,	139,668,035	139,672,636	90,627,783	42,511,725	6,533,128

APPENDIX F.

STATISTICS.

The following tables are given to show various features connected with the port of Boston. Tables I. to IV. deal with Boston's foreign trade. Table V. gives the value of manufactured products in Metropolitan Boston. Table VI. gives the population of Boston and various districts and zones within the State. Tables VII. to IX. deal with railroad operations in Massachusetts.

The following is a brief description of the various tables: —

Table I. Total Value of Imports and Exports of Merchandise of the United States. — This table gives the value of exports and imports for every tenth year from 1790 to 1880 inclusive. From 1881 to 1915 the value of imports and exports is given for each year. The total value of imports and exports has increased from $43,205,156 in 1790 to $4,442,759,080 in 1915. The total value of imports and exports in 1915 shows an increase of nearly 200 per cent. over the value in 1880.

Table II. Value of Imports and Exports of Merchandise at the Port of Boston. — This table gives the value of imports and exports at the port of Boston and also Boston's percentage of the imports and exports of the whole United States. The years given are 1860, 1870, 1880, and each year from 1881 to 1915 inclusive. The value of imports and exports in 1860 was $52,081,478 while in 1915 it was $260,129,468. The total value of imports and exports at the port of Boston in 1915 shows an increase of a little over 100 per cent. since 1880 as compared with a 200 per cent. increase in the whole United States for the same period.

The maximum percentage that the total of imports and exports of Boston bore to the whole United States was 10.52 per cent. for the years 1896 and 1897. This percentage has fallen off to 5.86 per cent. for 1915. The value of exports for Boston is, for 1915, about 70 per cent. of the value of imports, while for

the whole United States the value of exports is about 170 per cent. of the value of imports.

Table III. Value of Imports and Exports of Merchandise of Leading United States Ports by Decades. — This table gives the average annual value of imports and exports for ten-year periods from 1861 to 1910 and gives the average annual value for the five-year period from 1911 to 1915 inclusive. This information is also given in terms of the percentage of the whole United States. The ports considered are New York, New Orleans, Galveston, Boston, Philadelphia and Baltimore. Observation of this table shows that while New York has always led the other ports by a wide margin, Boston has, with one exception, been second until the last period, *i.e.*, from 1911 to 1915. For this period Boston has dropped to fourth place, being passed both by New Orleans and Galveston. Galveston, which occupied the last place through 1900, is now in the third place, and is led only by a very slight margin by New Orleans.

In connection with tables I. to III., inclusive, it should be observed, as noted in the tables, that, commencing July 1, 1913, certain of these ports were extended to include sub-ports located nearby. The imports and exports through these sub-ports, however, are so small in comparison with the original port, that the total values are not materially increased. The above tables are made up for the fiscal years ending June 30.

Table IV. Vessels entered and cleared, Port of Boston (District of Massachusetts), from and for Foreign Ports. — This table gives the number and tonnage of vessels in the foreign trade entering and clearing at the port of Boston for each year from 1883 to 1915. This information is shown separately for American and for foreign vessels. It may be seen readily that the number and tonnage of American vessels has decreased considerably since 1883. Although the number of foreign vessels has decreased to some extent, the tonnage has increased greatly, due to the large vessels now being operated by the foreign lines.

Table V. Value of Manufactured Products, Metropolitan Boston. — This table gives the value of manufactured products in Metropolitan Boston for the years 1895, 1904, 1909 and 1913. Totals are given for Metropolitan Boston and detailed figures for the various cities and towns within this district. Several of the smaller towns are grouped together as the figures are not available for each of these towns separately.

The Metropolitan District as considered by the State Bureau

of Statistics includes 39 cities and towns and in general is the same as the Metropolitan Park Commission's district with the addition of the town of Lexington.

The value of manufactured products for Metropolitan Boston in 1913 represents an increase of somewhat over 100 per cent. since 1895. The value of manufactured products for Boston proper has increased nearly 100 per cent. since 1895. In connection with this table, it should be noted that additional information as to the value of manufactured products in the year 1913 for Boston and various districts and zones in the State is given in Appendix C, Table I., in connection with the report on manufacturers' blanks.

Table VI. Population. — This table gives the population for every fifth year from 1875 to 1915 inclusive. The figures on the even ten years are those of the United States Census and the intermediate ones are those of the Massachusetts Census. The figures are shown for Boston proper, the Metropolitan District, the outer zone and the State. It is to be noted that the Metropolitan District and outer zone referred to here consist of 29 and 119 cities and towns respectively, and are the districts and zones referred to in Appendix C, dealing with the manufacturers' blanks. This table also shows the percentage of the population of the State located in Boston, the Metropolitan District, and the outer zone for 1875, 1895 and 1915. At the bottom of the table the percentage of increase during the forty years from 1875 to 1915 is shown for the various districts.

Table VII. Railroad Statistics, Massachusetts. — This table gives the number of passengers carried, the average length of passenger trip and the total passenger mileage for all of the railroads reporting to the Public Service Commission of Massachusetts. Similar information is given for freight tonnage, average freight trip and freight ton mileage. This information is given for every fifth year from 1875 to 1915 inclusive. It will be noted that figures for the year 1913 have also been included as they represent the normal increase of business before the European war had its effect on transportation. The railroad statistics are for the years ending June 30.

In connection with the passenger statistics, it may be seen that the percentage of increase in the number of passengers carried in 1915 over 1875 is nearly 300 per cent. as compared with a population increase of 114 per cent. in the same period. With

regard to the number of tons of freight carried, the increase for the same forty-year period is seen to be nearly 450 per cent. as compared with this population increase of 114 per cent.

Table VIII. Passenger and Freight Mileage (Three Roads) in 1915. — This table gives passenger and freight statistics for the three principal roads in the State, namely, the Boston & Albany, the Boston & Maine and the New York, New Haven & Hartford Railroad. By comparison of these figures with the total figures in Table VII. for 1915 it may readily be seen what a large share of the business of the Massachusetts roads is handled over these three systems.

Table IX. Average Passenger Fares and Freight Rates for Thirty Years. — This table gives the average passenger fare per mile for all the Massachusetts railroads for each year from 1886 to 1915. The average freight rate per ton mile is given for the same roads for each year from 1886 to 1915. Observation of this table shows how the passenger fare dropped in the twenty years from 1.88 cents to 1.63 cents from 1886 to 1908. From this point the fares increased to 1.81 cents for 1915. Similarly the average freight rate per ton dropped from 1.64 cents to 1.13 cents between 1886 and 1913. From this point it has risen to 1.18 cents in 1915. This table has been included as it shows at a glance how the cost of transportation, both passenger and freight, has varied during the past thirty years.

Table X. Expenditures for Port Development in Various Cities. — This table gives the amount of money spent in port development by various cities in Europe and America. The information in this table was obtained in some cases directly from the cities and in other cases from reports of various bodies.

Information contained in these tables has been obtained from the publications of the Boston Chamber of Commerce, Public Service Commission and the Bureau of Statistics of Massachusetts, the New York State Commission to investigate port conditions and the United States Bureau of Navigation, etc.

TABLE I. — *Value of Imports and Exports of Merchandise of the United States.*

FISCAL YEARS.	Value of Imports.	Value of Exports.	Value of Imports and Exports.
1790,	$23,000,000	$20,205,256	$43,205,156
1800,	91,252,768	70,971,780	162,224,548
1810,	85,400,000	66,757,970	152,157,970
1820,	74,450,000	69,691,669	144,141,669
1830,	62,720,956	71,670,735	134,391,691
1840,	98,258,706	123,668,932	221,927,638
1850,	173,509,526	144,375,726	317,885,252
1860,	353,616,119	333,576,057	687,192,176
1870,	435,958,408	392,771,768	828,730,176
1880,	667,954,746	835,638,658	1,503,593,404
1881,	642,664,628	902,377,346	1,545,041,974
1882,	724,639,574	750,542,257	1,475,181,831
1883,	723,180,914	823,839,402	1,547,020,316
1884,	667,697,693	740,513,609	1,408,211,302
1885,	577,527,329	742,189,755	1,319,717,084
1886,	635,436,136	679,524,830	1,314,960,966
1887,	692,319,768	716,183,211	1,408,502,979
1888,	723,957,114	695,954,507	1,419,911,621
1889,	745,131,652	742,401,375	1,487,533,027
1890,	789,310,409	857,828,684	1,647,139,093
1891,	844,916,196	884,480,810	1,729,397,006
1892,	827,402,462	1,030,278,148	1,857,680,610
1893,	866,400,922	847,665,194	1,714,066,116
1894,	654,994,622	892,140,572	1,547,135,194
1895,	731,969,965	807,538,165	1,539,508,130
1896,	779,724,674	882,606,938	1,662,331,612
1897,	764,730,412	1,050,993,556	1,815,723,968
1898,	616,049,654	1,231,482,330	1,847,531,984
1899,	697,148,489	1,227,023,302	1,924,171,791
1900,	849,941,184	1,394,483,082	2,244,424,266
1901,	823,172,165	1,487,764,991	2,310,937,156
1902,	903,320,948	1,381,719,401	2,285,040,349
1903,	1,025,719,237	1,420,141,679	2,445,860,916
1904,	991,087,371	1,460,827,271	2,451,914,642
1905,	1,117,513,071	1,518,561,666	2,636,074,737
1906,	1,226,562,446	1,743,864,500	2,970,426,946
1907,	1,434,421,425	1,880,851,078	3,315,272,503
1908,	1,194,341,792	1,860,773,346	3,055,115,138
1909,	1,311,920,224	1,663,011,104	2,974,931,328
1910,	1,556,947,430	1,744,984,720	3,301,932,150
1911,	1,527,226,105	2,049,320,199	3,576,546,304
1912,	1,653,264,934	2,204,322,409	3,857,587,343
1913,	1,813,008,234	2,465,884,149	4,278,892,383
1914,	1,893,925,657	2,364,579,148	4,258,504,805
1915,	1,674,169,740	2,768,589,340	4,442,759,080

NOTE. —For fiscal year ending June 30.

TABLE II. — *Value of Imports and Exports of Merchandise at the Port of Boston and Percentage of Whole United States.*

FISCAL YEARS.	Value of Imports.	Per Cent.	Value of Exports.	Per Cent.	Value of Imports and Exports.	Per Cent.
1860, ...	$39,333,684	11.12	$12,747,794	3.82	$52,081,478	7.57
1870, ...	47,484,060	10.91	12,012,965	3.05	59,497,025	7.17
1880, ...	68,503,136	10.25	59,237,831	7.08	127,740,967	8.48
1881, ...	61,960,103	9.64	73,433,677	8.13	135,393,780	8.76
1882, ...	69,594,057	9.60	62,471,426	8.32	132,065,483	8.95
1883, ...	72,552,075	10.07	62,356,749	7.56	134,908,824	8.70
1884, ...	65,865,551	9.87	63,497,829	8.57	129,363,380	9.17
1885, ...	53,445,929	9.25	62,000,103	8.33	115,446,032	8.74
1886, ...	58,430,707	9.19	54,099,505	7.97	112,530,212	8.55
1887, ...	61,018,330	8.81	59,001,505	8.39	120,019,835	8.52
1888, ...	63,897,778	8.80	56,457,384	8.11	120,355,162	8.47
1889, ...	66,731,023	8.94	66,835,595	9.00	133,566,618	8.97
1890, ...	62,876,666	7.96	71,202,944	8.03	134,079,610	8.14
1891, ...	71,212,614	8.44	77,020,081	8.93	148,232,695	8.58
1892, ...	71,780,489	8.69	87,175,636	8.36	158,956,125	8.55
1893, ...	79,357,654	9.15	85,460,422	10.08	164,818,076	9.61
1894, ...	50,309,331	7.67	83,972,460	9.40	134,281,791	8.67
1895, ...	66,889,113	9.13	85,505,196	10.59	152,394,314	9.89
1896, ...	79,179,864	10.16	95,851,004	12.29	175,030,868	10.52
1897, ...	90,178,319	11.79	100,857,281	9.60	191,035,600	10.52
1898, ...	51,475,099	8.36	117,531,903	9.55	169,007,002	9.15
1899, ...	52,057,960	9.00	128,037,149	10.43	180,095,109	9.40
1900, ...	72,195,939	8.49	112,195,555	8.05	184,391,494	8.22
1901, ...	61,452,370	7.47	143,708,232	9.66	205,160,602	8.88
1902, ...	71,921,436	8.00	102,404,304	7.40	174,325,740	7.68
1903, ...	86,310,586	8.41	88,126,444	6.21	174,437,030	7.13
1904, ...	80,657,697	8.14	89,845,772	6.15	170,503,469	6.95
1905, ...	100,317,881	8.98	87,804,492	5.78	188,122,373	7.14
1906, ...	106,442,077	8.68	98,739,647	5.66	205,181,724	6.91
1907, ...	124,432,977	8.68	100,872,147	5.36	225,305,124	6.80
1908, ...	93,678,716	7.84	96,051,068	5.16	189,729,784	6.21
1909, ...	112,472,595	8.57	76,157,558	4.58	188,630,153	6.34
1910, ...	129,006,184	8.28	70,516,789	4.03	199,522,973	6.70
1911, ...	116,597,440	7.00	71,534,082	3.48	188,131,522	5.56
1912, ...	129,293,016	8.00	69,692,171	3.16	198,985,187	5.60
1913, ...	146,599,451	8.08	69,552,657	2.82	216,152,108	5.05
1914, ...	159,915,970	8.45	65,715,181	2.78	225,631,151	5.30
1915, ...	152,653,791	9.12	107,475,677	3.88	260,129,468	5.86

NOTE. — For fiscal years ending June 30. Commencing July 1, 1913, the port of Boston includes sub-ports of Salem, New Bedford, Fall River, Plymouth, Gloucester, Vineyard Haven, Barnstable and Provincetown, under the heading "District of Massachusetts."

TABLE III. — *Value of Imports and Exports of Merchandise at Leading United States Ports by Decades.*

Fiscal Years.	Ports.	Average Annual Value of Imports.	Per Cent. of United States.	Average Annual Value of Exports.	Per Cent. of United States.	Average Annual Value of Imports and Exports.	Per Cent. of United States.
1861 to 1870,	New York,	$227,408,703	64.8	$137,648,066	34.5	$365,056,769	48.7
	Boston,	35,967,959	10.2	13,397,628	3.3	49,365,587	6.5
	New Orleans,	6,884,028	1.9	35,695,965	8.9	42,579,993	5.7
	Philadelphia,	11,516,632	3.2	10,697,226	2.6	22,213,858	3.0
	Baltimore,	9,691,370	2.7	9,636,169	2.4	19,327,539	2.5
	Galveston,	221,405	.06	3,133,547	.8	3,354,952	.4
1871 to 1880,	New York,	357,430,909	66.7	269,565,783	45.7	626,996,692	55.7
	New Orleans,	13,244,561	2.4	79,120,011	13.4	92,364,572	8.2
	Boston,	52,421,466	9.7	33,422,197	5.6	85,843,663	7.6
	Baltimore,	23,542,156	4.4	34,151,144	5.2	57,693,300	5.0
	Philadelphia,	23,584,576	4.4	31,162,248	5.7	54,746,824	5.0
	Galveston,	1,383,235	.2	14,387,692	2.4	15,770,927	1.4
1881 to 1890,	New York,	460,475,898	66.3	339,724,966	44.4	800,200,864	55.1
	Boston,	63,637,221	9.2	63,135,671	8.2	126,772,892	8.6
	New Orleans,	11,195,278	1.6	86,612,929	11.2	97,808,207	6.7
	Philadelphia,	38,478,519	5.5	36,093,616	4.7	74,572,135	5.2
	Baltimore,	13,333,911	1.9	51,334,249	6.6	64,668,160	4.4
	Galveston,	1,322,914	.1	19,682,955	2.4	21,005,869	1.4
1891 to 1900,	New York,	490,142,932	64.2	397,291,510	38.8	887,434,442	49.6
	Boston,	68,463,638	9.0	97,360,668	9.7	165,824,306	9.3
	New Orleans,	16,207,859	2.1	96,730,005	9.5	112,937,864	6.3
	Baltimore,	13,630,713	1.7	86,898,808	8.4	100,529,521	5.7
	Philadelphia,	50,450,865	6.4	49,963,545	4.7	100,414,410	5.6
	Galveston,	1,080,312	.1	51,069,128	4.7	52,149,440	2.8
1901 to 1910,	New York,	697,726,032	60.5	575,271,730	35.5	1,272,997,762	45.9
	Boston,	96,669,251	8.3	95,422,645	5.8	192,091,896	7.0
	New Orleans,	37,079,867	3.1	150,172,374	9.3	187,252,261	6.8
	Galveston,	3,385,920	.2	150,182,062	9.3	153,567,982	5.4
	Philadelphia,	64,125,104	5.5	81,215,180	5.0	145,340,284	5.2
	Baltimore,	26,231,394	2.2	90,218,198	5.6	116,449,592	4.2
1911 to 1915,	New York,	975,403,845	57.0	916,114,901	38.6	1,891,518,746	46.3
	New Orleans,	78,667,861	4.6	179,037,920	7.6	257,705,781	6.3
	Galveston,	7,610,809	0.4	241,253,688	10.1	248,864,497	6.1
	Boston,	141,011,934	8.2	76,793,953	3.2	217,805,887	5.3
	Philadelphia,	86,261,089	5.0	74,238,086	3.1	160,499,175	3.9
	Baltimore,	30,196,087	1.8	107,094,978	4.5	137,291,065	3.4

NOTE. — For fiscal years ending June 30. Commencing July 1, 1913, the above ports include certain sub-ports located near by.

TABLE IV. — *Vessels entered and cleared, Port of Boston (District of Massachusetts), from and for Foreign Ports.*

DATE.	ENTERED.				CLEARED.			
	AMERICAN VESSELS.		FOREIGN VESSELS.		AMERICAN VESSELS.		FOREIGN VESSELS.	
	Number.	Tonnage.	Number.	Tonnage.	Number.	Tonnage.	Number.	Tonnage.
1883, . . .	671	299,858	2,063	962,883	646	276,404	1,939	817,939
1884, . . .	617	275,737	1,909	901,565	566	253,455	1,811	786,142
1885, . . .	628	296,615	1,842	872,363	569	230,777	1,746	735,647
1886, . . .	555	254,697	2,092	1,003,827	617	262,317	1,967	824,368
1887, . . .	492	229,429	1,936	1,075,060	541	232,970	1,835	852,686
1888, . . .	451	208,173	1,836	1,090,392	616	267,131	1,705	850,560
1889, . . .	436	219,884	1,928	1,204,362	610	266,604	1,825	989,666
1890, . . .	377	197,731	1,938	1,252,139	244	136,021	1,212	892,470
1891, . . .	342	157,965	2,000	1,395,635	403	148,856	1,819	1,130,006
1892, . . .	370	201,045	2,026	1,504,447	415	179,442	1,876	1,263,939
1893, . . .	311	174,160	1,907	1,476,401	384	168,350	1,701	1,555,353
1894, . . .	273	181,358	1,806	1,558,282	180	156,122	1,668	1,668,962
1895, . . .	226	115,809	1,990	1,607,200	305	122,296	1,842	1,300,831
1896, . . .	245	146,276	1,843	1,696,858	335	159,057	1,679	1,455,772
1897, . . .	261	168,875	1,807	1,811,833	285	142,361	1,651	1,514,428
1898, . . .	158	89,507	1,639	1,859,029	229	101,415	1,518	1,613,880
1899, . . .	236	231,870	1,732	2,141,576	306	232,999	1,558	1,824,574
1900, . . .	212	215,673	1,455	2,049,358	294	253,645	1,324	1,723,765
1901, . . .	219	208,397	1,604	2,267,039	302	230,772	1,433	1,979,914
1902, . . .	220	194,805	1,536	2,476,712	284	231,321	1,305	1,852,078
1903, . . .	171	213,089	1,425	2,673,092	229	229,489	1,148	2,003,798
1904, . . .	122	166,034	1,278	2,476,868	203	188,913	1,085	1,969,053
1905, . . .	166	221,394	1,377	2,600,966	205	222,528	1,156	1,935,522
1906, . . .	110	151,634	1,476	2,908,568	151	175,740	1,229	2,159,177
1907, . . .	136	175,939	1,363	2,780,621	175	168,005	1,134	2,023,867
1908, . . .	117	182,293	1,238	2,618,740	107	139,237	1,017	1,875,661
1909, . . .	132	172,574	1,258	2,541,665	155	163,320	1,006	1,668,214
1910, . . .	129	197,096	1,234	2,602,576	141	157,314	1,001	1,702,765
1911, . . .	142	177,807	1,234	2,730,014	140	181,082	972	1,710,672
1912, . . .	166	192,502	1,273	2,869,231	170	163,276	957	1,704,771
1913, . . .	260	254,996	1,312	2,937,197	244	235,305	1,017	1,907,702
1914, . . .	310	185,709	1,342	2,866,716	238	157,294	997	1,812,046
1915, . . .	340	326,878	1,095	1,942,672	280	268,556	802	1,248,584

NOTE. — For years ending December 31.

TABLE V. — *Value of Manufactured Products, Metropolitan Boston.*

CITIES AND TOWNS.	VALUE OF PRODUCT.			
	1895.	1904.	1909.	1913.
Metropolitan Boston,	$272,150,680	$418,903,402	$510,583,337	$560,390,104
BOSTON,	130,423,010	184,351,163	237,457,472	252,222,872
LYNN,	31,720,744	55,003,023	71,503,140	78,947,766
CAMBRIDGE,	34,246,041	42,407,064	44,227,395	51,863,096
SOMERVILLE,	14,113,045	22,955,197	38,686,527	50,279,057
CHELSEA,	8,140,290	13,879,159	17,002,492	16,167,466
Watertown,	2,617,160	15,524,675	11,545,555	15,153,987
QUINCY,	3,055,338	8,982,446	10,505,403	12,922,051
EVERETT,	1,390,976	6,135,650	8,746,923	11,603,469
MALDEN,	6,542,307	11,235,635	8,205,852	7,866,779
WALTHAM,	4,199,361	7,149,697	7,814,178	11,571,080
Hyde Park,	3,491,622	6,739,307	7,336,084	–[1]
Weymouth,	4,732,718	4,921,955	6,627,168	8,184,508
NEWTON,	3,304,066	4,140,996	6,278,714	5,295,231
Wakefield,	2,705,892	4,807,728	5,527,102	5,921,258
WOBURN,	5,286,639	4,654,067	5,408,081	6,025,416
Winchester,	2,153,687	3,180,821	4,094,684	4,897,398
Braintree,	1,415,279	2,433,576	3,562,147	5,958,316
Stoneham,	2,228,886	2,948,031	3,247,645	2,163,926
MELROSE,	2,857,582	9,450,929	2,824,669	2,502,289
MEDFORD,	1,015,379	871,820	2,045,289	2,633,117
Canton,	1,954,662	1,713,457	1,633,804	1,932,267
Needham,	577,230	688,024	1,432,240	2,149,137
Arlington,	290,531	493,208	695,356	370,043
Dedham,	556,014	1,326,665	669,059	746,811
Wellesley,	445,108	349,570	606,586	655,986
Saugus,	638,377	408,057	590,799	–
Brookline,	1,064,107	732,845	532,303	590,436
Milton,	216,975	309,135	413,457	171,622
REVERE,	182,834	355,060	407,336	491,131
Lexington,	112,599	160,440	303,224	343,062
Hingham,	–[2]	–[2]	213,415	182,836
Belmont,	61,667	94,433	109,247	–
Winthrop,	39,675	23,516	42,168	38,752
Swampscott,	65,537	75,203	35,276	28,454
Westwood,	–[3]	–[3]	7,106	–
Other towns,	305,342[4]	400,850[5]	245,441[6]	510,485[7]

[1] Included in Boston.

[2] Included in other towns.

[3] Part of Dedham.

[4] Includes Dover, Weston and Hingham. No manufacturing establishments in Cohasset, Hull and Nahant.

[5] Includes Cohasset, Dover, Hingham, Hull and Weston. No manufacturing establishments in Nahant.

[6] Includes Cohasset, Dover, Hull, Nahant and Weston.

[7] Includes Belmont, Cohasset, Dover, Hull, Nahant, Saugus, Weston and Westwood.

NOTE. — Metropolitan District, as considered by the Bureau of Statistics, includes 39 cities and towns.

TABLE VI. — *Population.*

YEARS.	Boston.	Metropolitan District (29 Cities and Towns).	Outer Zone (119 Cities and Towns).	State.
1875,	348,235	595,482	989,099	1,651,912
1880,	369,927	645,929	1,077,115	1,783,085
1885,	398,769	719,913	1,094,731	1,942,141
1890,	458,670	858,170	1,383,373	2,238,943
1895,	508,746	988,305	1,561,110	2,500,183
1900,	574,136	1,128,704	1,758,158	2,805,346
1905,	609,890	1,226,858	1,892,939	3,003,680
1910,	686,092	1,378,435	2,123,106	3,366,416
1915,	745,439	1,536,576	2,332,851	3,693,310
Percentage of State.				
1875,	21.1	36.0	59.8	100
1895,	20.3	39.5	62.4	100
1915,	20.2	41.6	63.2	100
Percentage Increase in Forty Years.				
1875 to 1915,	114	158	136	123

TABLE VII. — *Railroad Statistics, Massachusetts.*

YEARS.	Number of Passengers carried.	Average Passenger Trip Miles.	Passenger Miles.	Freight Tons carried.	Average Freight Trip Miles.	Freight Ton Miles.
1875,	42,139,671	15.30	655,615,588	11,072,312	52.25	579,868,983
1880,	45,151,152	15.70	708,645,422	17,221,567	55.70	959,429,750
1885,	69,603,700	14.97	1,041,628,073	20,577,096	61.53	1,266,160,455
1890,	98,843,712	14.75	1,458,149,088	27,944,501	70.73	1,976,652,769
1895,	107,856,348	15.17	1,636,197,381	30,858,173	83.01	2,561,598,881
1900,	108,768,303	17.08	1,858,253,279	40,316,711	85.81	3,459,439,263
1905,	124,234,267	17.75	2,205,586,782	45,874,649	92.31	4,234,491,283
1910,	160,769,201	17.23	2,771,121,457	55,786,434	97.41	5,433,908,081
1913,[1]	170,278,768	17.39	2,961,169,563	63,729,052	101.09	6,442,438,763
1915,	159,285,185	17.44	2,778,395,343	59,637,608	99.14	5,912,684,341

[1] Last normal year of railroading.

NOTE. — These figures represent total business on all the railroads reporting to the Public Service Commission of Massachusetts, years ending June 30.

TABLE VIII. — *Passenger Mileage (Three Roads) in 1915.*

RAILROAD COMPANIES.	Passengers carried.	Average Journey (Miles).	Total Passenger Mileage.
Boston & Albany,	11,593,977	27.41	317,782,405
Boston & Maine,	48,388,177	17.56	849,948,853
New York, New Haven & Hartford,	78,172,698	18.52	1,447,868,934

Freight Mileage (Three Roads) in 1915.

RAILROAD COMPANIES.	Tons of Freight hauled.	Average Haul (Miles).	Total Freight Mileage.
Boston & Albany,	8,994,385	116.20	1,045,191,179
Boston & Maine,	22,678,480	106.55	2,416,458,253
New York, New Haven & Hartford,	23,842,023	91.64	2,185,109,160

NOTE. — Years ending June 30.

TABLE IX. — *Average Passenger Fare per Mile (All Massachusetts Roads) for Thirty Years, 1886–1915.*

YEARS.	Fares (Cents).	YEARS.	Fares (Cents).	YEARS.	Fares (Cents).
1886,	1.88	1896,	1.79	1906,	1.70
1887,	1.85	1897,	1.80	1907,	1.65
1888,	1.90	1898,	1.78	1908,	1.63
1889,	1.87	1899,	1.77	1909,	1.64
1890,	1.82	1900,	1.75	1910,	1.65
1891,	1.83	1901,	1.75	1911,	1.72
1892,	1.83	1902,	1.73	1912,	1.73
1893,	1.83	1903,	1.73	1913,	1.74
1894,	1.80	1904,	1.72	1914,	1.72
1895,	1.78	1905,	1.70	1915,	1.81

Average Freight Rate per Ton Mile (All Massachusetts Roads) for Thirty Years, 1886–1915.

YEARS.	Rates (Cents).	YEARS.	Rates (Cents).	YEARS.	Rates (Cents).
1886,	1.64	1896,	1.28	1906,	1.23
1887,	1.62	1897,	1.25	1907,	1.19
1888,	1.55	1898,	1.22	1908,	1.17
1889,	1.50	1899,	1.18	1909,	1.19
1890,	1.45	1900,	1.22	1910,	1.18
1891,	1.42	1901,	1.20	1911,	1.17
1892,	1.36	1902,	1.24	1912,	1.17
1893,	1.39	1903,	1.23	1913,	1.13
1894,	1.33	1904,	1.27	1914,	1.16
1895,	1.28	1905,	1.14	1915,	1.18

TABLE X. — *Expenditures for Port Development in Various Cities.*

Europe.	
London,	$200,000,000 00
Liverpool,	155,000,000 00
Hamburg,	115,000,000 00
Manchester,	100,000,000 00
Newcastle,	90,000,000 00
Antwerp,	60,000,000 00
Glasgow,	50,000,000 00
Rotterdam,	50,000,000 00
Bristol,	40,000,000 00
Marseilles,	40,000,000 00
Havre,	30,000,000 00
Southampton,	30,000,000 00
Genoa (1903–10),	25,000,000 00
Canada.	
Montreal (Federal Government),[1]	$26,000,000 00
United States.	
Boston (State),[2]	15,477,360 62
New York (City),	132,000,000 00
San Francisco (State),	51,000,000 00
New Orleans (State, $25,000,000; City, $2,000,000),[3]	27,000,000 00
Philadelphia (State, $1,500,000; City, $15,100,000),[4]	16,600,000 00
Baltimore (City),[5]	10,000,000 00
Seattle (County),[6]	6,300,000 00
Los Angeles (City),[7]	5,000,000 00
Portland (City),[8]	2,500,000 00

[1] $9,000,000 available for further development.
[2] Expended or contracted for 1870 to 1915 inclusive, all but $2,784,152.94 has been expended.
[3] Total provided for development. $2,000,000 of this for belt line.
[4] Railroads and city to spend $25,000,000 on various terminal improvements.
[5] Includes $1,000,000 on belt line and highway.
[6] Total appropriated. About $5,000,000 spent to date.
[7] Policy of spending $10,000,000 in ten years adopted in 1909.
[8] Proposed $15,000,000 additional improvements.

NOTE. — United States government appropriations not included.

APPENDIX G.

SUMMARY OF PRINCIPAL TRANSPORTATION DEVELOPMENTS IN MASSACHUSETTS, WITH THE MORE IMPORTANT REPORTS OF SPECIAL AND PERMANENT COMMISSIONS.

1826. — Granite Railroad Company chartered and operated in Quincy. (This was the first railroad in the United States. It was a horse tramway four miles long and extended from Bunker Hill quarry, in which was obtained the granite for the Bunker Hill Monument, to Neponset River. It cost $50,000.)

1826. — House of Representatives appointed first committee to investigate subject of proposed railroad from Boston to the Hudson River. (It reported that it was satisfied "not only of the practicability but the expediency of building the railway from Boston to the Hudson River." No action was taken upon this report by the Legislature.)

1827. — Resolve appropriating $10,000 for Commission to make survey for a railroad to the Hudson was passed by the Legislature. (This Commission reported the next year in favor of a railway to be operated by animal power.)

1828. — Franklin Railroad Company incorporated to build a railroad from Boston to State Line, New Hampshire or Vermont. The Massachusetts Railroad Corporation was created to construct a railroad from Boston to the west line of Massachusetts, "with a view to its final termination at the Hudson River." Boston & Providence and Taunton Railroad Corporation was created to construct a railroad from Boston to head of navigation of the Pawtucket River, or to the Rhode Island State Line in Pawtucket.

1829. — Board of Internal Improvements recommended the construction of a railroad between Boston and the Hudson, to be aided by the Commonwealth and to be operated by horse power. (The Legislature did not approve State aid plan at that time.)

1830. — Boston & Lowell Railroad Company chartered to build a railroad from Boston to Lowell.

1835. — First commission (L. Baldwin, S. Thayer and James Hayward) appointed to make a survey of a portion of Boston harbor and to recommend harbor lines. Commission reported in 1837.

1837. — First harbor lines established by Legislature.

1842. — Railroad between Boston and Albany completed — Boston and Worcester and Western railroads. The State subsidized this "Western" railroad; it appropriating $1,000,000 at first and other sums later. This road, which later became the Boston & Albany Railroad, was the first "through" railroad in the United States.

1846. — The Commission appointed in 1845 to survey south bay, etc. (James Hayward and Ezra Lincoln, Jr.), made their report.

1847. — Commission (Thomas G. Cary, Simeon Borden and Ezra Lincoln, Jr.) appointed in 1846 to examine the position of the flats in Boston harbor, between South Boston and the channel.

1847. — Report of Commission (Joseph Bell and Ezra Lincoln, Jr.) appointed to examine the position of the flats in Boston harbor.

1849. — Report of Commission (Samuel S. Lewis and Ezra Lincoln, Jr.) appointed in 1847 to make a survey of Boston harbor.

1849. — Report of Commission (Richard Fletcher, David Cummings, Geo. S. Boutwell and Charles Hudson) appointed in 1848 to study questions in relation to flats in Boston harbor.

1850. — Report of Commission (John M. Williams, David Cummings, Thomas Hopkinson, George S. Boutwell and Charles Hudson) appointed in 1848 to investigate flats in Boston harbor.

1851. — Report of Commission (Simon Greenleaf, Joel Giles and Ezra Lincoln) relative to Boston harbor.

1852. — Report of Commission (Simon Greenleaf, Joel Giles and Ezra Lincoln) concerning Boston harbor.

1856. — Joint Special Committee reported on so much of the Governor's address as related to the flats on the northerly shore of South Boston, which had been referred to them.

1856. — First street railway operated in Massachusetts.

1859. — Federal Government at request of Mayor and City Council of Boston appointed a Commission of United States

officers to make a survey and examination of Boston harbor. Commission made 10 reports; recommended the establishment of State Commission to be charged with the duty of supervising the building of structures, filling of flats, and the regulation and control of other work in tidewater.

1863–67. — The Commonwealth built the five-mile Hoosac Tunnel together with 40 miles of connecting railroad. Later this was sold to the Boston & Maine Railroad for $5,000,000.

1866. — Plans for taking and development of Commonwealth's flats at South Boston approved and adopted by Legislature.

1866. — Board of Harbor Commissioners created as result of Federal Commission's recommendations, and given certain jurisdiction and supervision over all harbors and tidewaters, and "all the flats and land flowed thereby" except Back Bay lands.

1867. — Congress made first appropriation for improvement of Boston harbor.

1868. — Report of Committee (J. B. Marshall, chairman) on Commonwealth flats near South Boston.

1869. — First Board of Railroad Commissioners appointed.

1869. — Commonwealth sold about 25 acres of its flats in South Boston to the trustees of the Boston, Hartford & Erie Railroad Company for $545,505. (This parcel was located at the junction of Fort Point Channel and the main channel of the harbor. (Chapters 450 and 451, Acts of 1869.) This land was bought in by the State at a mortgagee's sale in 1871. The New York & New England Railroad Company purchased this tract in 1880 (chapter 260) for $1,000,000; also 12 acres located southerly of Congress Street, formerly Eastern Avenue, for $108,165). Such parts of the Commonwealth flats as were not always owned by the State were taken under various acts of the Legislature, the first of these, the Harbor and Land Act, officials say, was in the "60's."

1869. — Boston & Albany Railroad Company purchased 50 acres of the flats lying easterly of those sold to Boston, Hartford & Erie at 20 cents a square foot. After having paid $350,000 for this land the Boston & Albany Railroad Company transferred it to the New York & New England Railroad Company in 1880 with the consent of the State, the latter company agreeing to assume the responsibilities of the Boston & Albany and to pay the State $100,000 additional.

1871. — Joint Commission of Railroad Commissioners and Harbor Commissioners investigated terminal facilities of railroads entering Boston from the north. They recommended the use of sidings of the Marginal Freight Railway at the wharves as local freight delivery points. They also recommended rearrangement of passenger stations to avoid grade crossings between the different roads, and the rearrangement and reduction of the number of railroad bridges over the Charles River.

1873. — State, city, Boston Wharf Company, and the Boston & Albany Railroad Company agreed to develop "South Boston flats." The construction of Northern Avenue was then first officially contemplated.

1875. — Two separate Joint Committees of the Legislature recommended legislation providing for placing of Commonwealth's flats in South Boston under a commission or "agents" and for the authorization of the construction of a connecting railroad to connect the flats with the railroads.

1875. — Legislation passed for appointment of agents to make contracts for development of the Commonwealth lands near South Boston, and to secure additional railroad connections for these lands by means of a junction railroad.

1879. — Board of Harbor and Land Commissioners created.

1880. — Joint Commission of Railroad and Harbor and Land Commission considered question of proposed Commonwealth flats connecting railroad, and reported that legislation should first be enacted to give the existing railroads an opportunity of connecting with flats.

1880. — Belt Railroad suggested by James Alexander of the Cunard Line and others to connect East Boston and South Boston water fronts via Revere, Chelsea, Malden, Medford, Somerville, Cambridge, Watertown, Brighton, Brookline, Dedham and Dorchester.

1882. — Joint Commission of Railroad and Harbor and Land Commissioners investigated question of connection of railroads with the docks, and opposed any "coercive legislation" to force owners of wharves and docks to adopt feature of common access upon equal terms. Commission held this would hinder rather than promote progress.

1889. — First electric car operated in Massachusetts. (This car was run in Boston, January 2, of this year.)

1891–92. — Commission to promote rapid transit for Boston and suburbs recommended complete readjustment of terminal facilities of the steam roads entering Boston, including the construction of the North and South Stations and two lines of elevated road; the separation of freight business from passenger traffic; the readjustment of certain street lines; the reorganization of street railways; and the revocation of the charter of the Grand Junction road.

1893. — Surveying department of the city of Boston made an investigation and recommended that the Union Freight Company be required to do its business at night; urged a general city plan; made suggestions for street widenings and for the development of the South Bay district; the relocation of the Boston & Maine and Boston & Albany freight railways in East Boston, and of the water-front line there; also the construction of an elevated railroad and proper ordinances for use of streets.

1893. — Joint Special Legislative Committee investigated the question of rapid transit in Boston and recommended the creation of a Metropolitan Transit Commission; the construction of an elevated railroad; and the construction of the Tremont Street subway. (Metropolitan Transit Commission Act passed by the Legislature but rejected by the people on referendum.)

1893. — Boston Subway Commission of three members appointed to construct Tremont Street subway.

1894. — Surveying department of the city of Boston made an investigation and urged the development of water-front facilities and the adoption of scientific plan for improvement of water transportation conditions of the district.

1894. — Joint Special Committee of Boston City Council reported in favor of establishing a modern dock system under public ownership, and the construction of an elevated railroad similar to that in Liverpool.

1894. — Boston Transit Commission created by adding 2 members to Boston Subway Commission. Act further provided for construction of elevated road in Boston and for incorporation of the Boston Elevated Railway Company.

1895–97. — Massachusetts State Board on Docks and Terminal Facilities made an investigation of public ownership of water-front terminal facilities and urged public ownership of some

of water front and wharves, but was against public ownership of entire water-front facilities.

1897. — Harbor and Land Commission authorized to take portions of East Boston flats and to construct "Commonwealth" Pier at South Boston. Work commenced on the dock December 1. Commission recommended construction of railroad connections to Commonwealth Pier and announced its intention of providing for car float ferry approach to the pier.

1901. — The laying-out and construction of Northern Avenue first provided for by Legislature. (City failed to accept the act.)

1903. — Laying-out and construction of Northern Avenue and Sleeper Street finally provided for. Street and bridge completed in 1908.

1907. — Harbor and Land Commission reported that the construction and maintenance of a system of public docks in Boston to be publicly owned and controlled would be inadvisable at that time.

1907. — Water-front Commission of Boston urged that steps be taken to improve the port facilities of Boston and the creation of a permanent Board under public or private authority for the construction and control of docks and supervision of shipping, etc.

1907. — Studies by Boston Chamber of Commerce, Associated Board of Trade of Boston, Boston Merchants Association, Boston Real Estate Exchange, Boston Clearing House Association, Boston Central Labor Union, Citizens' Association of Boston, Boston Board of Underwriters, Boston Society of Civil Engineers, Metropolitan Improvement League, Boston Stock Exchange and Master Builders' Association.

1907–08. — Boston Transit Commission investigated teaming traffic, freight movements and proposed tunnels for freight transportation, including teaming tunnel in Boston. The Commission declined to recommend construction of teaming tunnels or widening of streets at that time.

1907–08. — Commission on Commerce and Industry reported in favor of merger of Boston & Maine and New York, New Haven & Hartford railroads.

1907–09. — The Metropolitan Improvements Commission recommended sweeping changes in the terminal facilities of *metropolitan Boston* and the appointment of a commission